

**EPA Superfund
Record of Decision:**

**PORTLAND CEMENT (KILN DUST 2 & 3)
EPA ID: UTD980718670
OU 01
SALT LAKE CITY, UT
07/19/1990**

Text:

(1) INHALATION

OF FUGITIVE DUST, (2) DIRECT CONTACT WITH WASTE CKD ON SITES 2, 3, AND THE WEST SITE, AND (3) THERE IS ALSO CONTAMINANT MIGRATION FROM THE WASTE CKD TO THE UNDERLYING GROUND WATER, WHICH IS A POTENTIAL SOURCE OF DRINKING WATER AND OTHER BENEFICIAL USES.

ACTUAL OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THIS SITE, IF NOT ADDRESSED BY IMPLEMENTING THE RESPONSE ACTION SELECTED IN THIS RECORD OF DECISION (ROD), MAY PRESENT AN IMMINENT AND SUBSTANTIAL ENDANGERMENT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT.

SELECTED REMEDY

THE STATE OF UTAH AS LEAD AGENCY ON THIS SITE, HAS IDENTIFIED ALTERNATIVE 7C - EXCAVATION AND OFF-SITE DISPOSAL IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL - AS THEIR PREFERRED ALTERNATIVE FOR OPERABLE UNIT 1. THE EPA HAS SELECTED THE STATE OF UTAH'S PREFERRED ALTERNATIVE (ALTERNATIVE 7C) AS THE SELECTED REMEDY FOR OPERABLE UNIT 1. SOME MODIFICATIONS HAVE BEEN MADE TO ALTERNATIVE 7C, WHICH ARE DESCRIBED IN THIS RECORD OF DECISION (ROD). THE SELECTED REMEDY WILL REMOVE AN ESTIMATED 495,000 CUBIC YARDS OF WASTE CKD AND SEPARATE AND TEMPORARILY STORE ABOUT 360 TONS OF CHROMIUM-BEARING REFRACTORY KILN BRICK AT THE SITE. THE WASTE CKD COVERS AN AREA OF APPROXIMATELY 71 ACRES, AND IS IN CONTACT WITH SHALLOW GROUND WATER. REMOVAL OF WASTE CKD FROM THE SITE WILL REDUCE EXPOSURE TO FUGITIVE DUST, ELIMINATE THE PATHWAY OF DIRECT EXPOSURE TO WASTE CKD AND ANY FUTURE HUMAN EXPOSURE PATHWAYS, AND WILL REMOVE THE SOURCE OF GROUND WATER CONTAMINATION. ADDITIONALLY, THE REMOVAL OF THE WASTE CKD WILL FACILITATE THE FINAL REMEDIATION OF THE SITE.

STATUTORY DETERMINATIONS

THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, COMPLIES WITH FEDERAL AND STATE REQUIREMENTS THAT ARE LEGALLY APPLICABLE OR RELEVANT AND APPROPRIATE TO THE REMEDIAL ACTION, AND IS COST-EFFECTIVE. THE SELECTED REMEDY CONSTITUTES A PERMANENT SOLUTION TO THE MAXIMUM EXTENT PRACTICABLE FOR THE WASTE CKD.

TWO TREATMENT ALTERNATIVES INVOLVING WASTE SOLIDIFICATION TO REDUCE CONTAMINANT MOBILITY ARE CONSIDERED LESS EFFECTIVE AND LESS PERMANENT THAN THE SELECTED REMEDY. TWO OTHER ALTERNATIVES INVOLVING REUSE OF THE WASTE CKD AS A RESOURCE WERE CONSIDERED NONVIABLE BECAUSE LONE STAR INDUSTRIES WAS NOT ABLE TO IDENTIFY OR DEVELOP ANY MARKETS FOR REUSE OF THE WASTE CKD. THEREFORE, TREATMENT OF THE PRINCIPAL THREATS OF THE SITE WAS FOUND NOT TO BE PRACTICABLE AND THUS THIS REMEDY DOES NOT SATISFY THE STATUTORY PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT.

BECAUSE THE SELECTED REMEDY WILL RESULT IN HAZARDOUS SUBSTANCES REMAINING ON-SITE WHICH MAY BE ABOVE HEALTH-BASED LEVELS, A REVIEW WILL BE CONDUCTED WITHIN FIVE YEARS AFTER COMMENCEMENT OF REMEDIAL ACTION TO ENSURE THAT THE REMEDY CONTINUES TO PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

RESTRICTIONS ON LAND USE AND LONG-TERM MONITORING WOULD BE REQUIRED FOR THE NEW, OFF-SITE, INDUSTRIAL LANDFILL TO BE CONSTRUCTED IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL IN SALT LAKE CITY, UTAH.

THIS ROD WILL BE FOLLOWED BY ANOTHER OPERABLE UNIT(S) WHICH WILL ADDRESS THE FINAL REMEDIATION OF THE SITE.

JAMES J. SCHERER
REGIONAL ADMINISTRATOR
EPA REGION VIII

DATE 07/19/90

KENNETH L. ALKEMA, DIRECTOR

DATE 07/20/90

UTAH DIVISION OF ENVIRONMENTAL HEALTH

THE RECORD OF DECISION

PORTLAND CEMENT COMPANY (KILN DUST #2 AND #3)
SALT LAKE CITY, UTAH

#SNL

1. SITE NAME, LOCATION, AND DESCRIPTION

THE PORTLAND CEMENT COMPANY (KILN DUST #2 AND #3) SITE IS LOCATED IN SALT LAKE CITY, UTAH, ON THE WEST SIDE OF REDWOOD ROAD (1700 WEST) AT 1000 SOUTH (FIGURE 1-1), WITHIN A TRIANGULAR AREA DEFINED BY INDIANA AVENUE, REDWOOD ROAD AND THE JORDAN RIVER SURPLUS CANAL. THE SITE IS APPROXIMATELY ONE MILE SOUTH OF US INTERSTATE 80, AND APPROXIMATELY 1.5 MILES SOUTHEAST OF SALT LAKE CITY INTERNATIONAL AIRPORT. THE SITE CONSISTS OF THREE SEPARATE BUT ADJACENT PROPERTIES KNOWN AS SITE 2, SITE 3, AND THE WEST SITE (FIGURE 1-2) HEREAFTER REFERRED TO AS THE "SITE". SITE 2 COVERS APPROXIMATELY 17 ACRES, SITE 3 COVERS APPROXIMATELY 19 ACRES, AND THE WEST SITE COVERS APPROXIMATELY 35 ACRES. THE ENTIRE SITE OCCUPIES AN AREA OF APPROXIMATELY 71 ACRES.

APPROXIMATELY 495,000 CUBIC YARDS OF WASTE CKD ARE PRESENT ON THE SITE, AND APPROXIMATELY 360 TONS OF CHROMIUM-BEARING REFRACTORY KILN BRICK ARE DISPOSED WITH THE WASTE CKD. IN THE EASTERN AREA OF THE SITE (SITES 2 AND 3 ON FIGURE 1-2) WASTE CKD IS PRESENT ON THE GROUND SURFACE IN THICKNESSES OF FROM 3 FEET TO GREATER THAN 6 FEET. ON THE WEST SITE (FIGURE 1-2) MUCH OF THE WASTE CKD HAS BEEN MIXED WITH AND COVERED BY FILL AND DEMOLITION MATERIALS, BUT APPEARS TO BE PRESENT IN POCKETS OF UP TO 7 FEET IN THICKNESS. A CONTAMINANT PLUME FROM THE WASTE CKD IS PRESENT IN THE SHALLOW GROUND WATER BENEATH THE SITE AND SOME ADJACENT PROPERTIES.

TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS RELATIVELY FLAT WITH ELEVATIONS VARYING SLIGHTLY ABOVE AND BELOW 4225 FEET ABOVE MEAN SEA LEVEL. EARLY SURVEYS SHOW THAT BEFORE FILL WAS PLACED AT THE SITE A GRADE BREAK EXISTED IN THE GROUND SURFACE WHICH BISECTED THE TRIANGULAR-SHAPED AREA ALONG A NORTHWEST-SOUTHEAST AXIS. LAND TO THE NORTHEAST OF THIS BREAK WAS RELATIVELY HIGH GROUND AND WAS USED FOR AGRICULTURAL AND RESIDENTIAL PURPOSES. LANDS SOUTHWEST OF THE BREAK WERE LOW SALT FLATS.

ADJACENT LAND USE

THE AREA NEXT TO THE SITE IS PRIMARILY INDUSTRIAL AND BORDERS LOW DENSITY RESIDENTIAL AND VACANT OR AGRICULTURAL LANDS. THE IMMEDIATE AREA SURROUNDING THE SITE IS HIGHLY COMMERCIALIZED AND INDUSTRIALIZED. RESIDENTIAL AREAS EXIST PRIMARILY EAST OF THE SITE AND INCLUDE SINGLE-FAMILY DWELLINGS, MOBILE HOME PARKS, AND SOME HIGH DENSITY MULTI-FAMILY RESIDENTIAL UNITS.

SOILS

THE NATURAL SOILS UNDERLYING THE SITE ARE POORLY DRAINED AND ARE AFFECTED BY SALINITY AND ALKALINITY. USES ARE GENERALLY LIMITED TO RANGE AND WILDLIFE HABITAT WITH SOME SMALL AREAS RECLAIMED FOR AGRICULTURE. PLACEMENT OF FILL MATERIALS HAS RAISED THE SURFACE ELEVATION OF THE SITE AND HAS RESULTED IN AN UNEVEN GROUND SURFACE OCCASIONALLY STREWN WITH PILES OF DEBRIS. DRAINAGE IS STILL POOR EVEN THOUGH THE AREA HAS BEEN FILLED. OCCASIONAL AREAS OF PONDED WATER DEVELOP IN CONFINED DEPRESSIONS EAST AND SOUTH OF SITE 2, BETWEEN SITE 2 AND SITE 3, AND NORTH OF SITE 3.

SURFACE WATER

THE SURPLUS CANAL AND THE CITY DRAIN ARE EXISTING SURFACE WATER FEATURES ADJACENT TO OR PASSING THROUGH THE SITE (FIGURE 1-2). THE SURPLUS CANAL FLOWS ALONG THE SOUTHERN BOUNDARY OF THE SITE. IT CARRIES EXCESS FLOW FROM THE JORDAN RIVER TO THE GREAT SALT LAKE IN A NORTHWESTERLY DIRECTION. THE CITY DRAIN CARRIES URBAN STORM DRAINAGE THROUGH THE SITE ON A NORTHWESTERLY COURSE. THE DRAIN SEPARATES SITES 2 AND 3 AND BOUNDS THE WEST SITE ON THE NORTH. THE CITY DRAIN IS PART OF THE URBAN STORM SEWER SYSTEM AND IS CLASSIFIED BY THE STATE OF UTAH AS CLASS 6 SURFACE WATER. SUCH WATER IS PROTECTED WHEN CONVENTIONAL BENEFICIAL USES DO NOT APPLY, WITH STANDARDS FOR THIS CLASS BEING DETERMINED ON A CASE-BY-CASE BASIS.

GROUND WATER

GROUND WATER UNDER THE SITE OCCURS IN THREE DIVISIONS: (1) A SHALLOW GROUND WATER BODY OVERLYING CONFINING LAYERS, (2) LOCAL PERCHED WATER BODIES, AND (3) AN ARTESIAN BASIN OR RESERVOIR INCLUDING THE RECHARGE AREA. THE PRIMARY RECHARGE AREA FOR THE ARTESIAN BASIN IS ALONG THE BENCHLANDS ON THE SIDES OF THE SALT LAKE VALLEY WHERE THE GROUND WATER IS UNCONFINED.

THE SHALLOW OR UNCONFINED AQUIFER COMPRISES THE NEAR-SURFACE UNCONSOLIDATED DEPOSITS. THEY ARE GENERALLY LAKE SEDIMENTS COMPOSED OF INTERLAYERED CLAYS, CLAYEY SILTS AND THIN SAND STRINGERS VARYING IN THICKNESS FROM LESS THAN A TENTH OF AN INCH TO SEVERAL FEET. THE "GROUND WATER QUALITY PROTECTION REGULATIONS" ADOPTED IN 1989 BY THE UTAH DEPARTMENT OF HEALTH CLASSIFY THE SHALLOW, UNCONFINED GROUND WATER IN THE AREA OF THE PORTLAND CEMENT SITE AS CLASS II AND CLASS III GROUND WATER BASED ON DATA COLLECTED IN THE RI.

BENEATH THE NEAR-SURFACE DEPOSITS, THICKER CLAY LAYERS MAKE UP THE CONFINING LAYER OR AQUITARD WHICH SEPARATES THE DEEP CONFINED AQUIFER FROM THE SHALLOW UNCONFINED GROUND WATER BODY. THE DEEP AQUIFER, WHICH IS THE PRINCIPAL GROUND WATER SOURCE IN THE SALT LAKE VALLEY, CONSISTS OF HIGH PERMEABILITY SANDS AND GRAVELS INTERBEDDED WITH SILTS AND CLAYS.

THE HORIZONTAL GROUND WATER GRADIENT OF THE DEEP CONFINED AQUIFER IN THE VICINITY OF THE SITE IS TO THE NORTH-NORTHWEST TOWARD THE GREAT SALT LAKE. REGIONAL STUDIES OF THE SHALLOW UNCONFINED AQUIFER SHOW ITS HORIZONTAL GRADIENT TO BE GENERALLY TOWARD THE JORDAN RIVER, OR TO THE NORTHEAST. LOCAL CONDITIONS IN THE SHALLOW AQUIFER, HOWEVER, CAN STRONGLY AFFECT THE GRADIENT. ALTHOUGH THE LOCAL GRADIENT OF THE SHALLOW AQUIFER IN THE AREA IS GENERALLY TO THE WEST, IT IS STRONGLY INFLUENCED BY THE JORDAN RIVER SURPLUS CANAL, THE CITY DRAIN, AND A NORTH-SOUTH TRENDING BELOW-GRADE SEWER LINE LOCATED ALONG THE WEST SIDE OF SITES 2 & 3.

NATURAL RESOURCES

THE SALT LAKE CITY AREA IS WITHIN THE GREAT BASIN SECTION OF THE BASIN AND RANGE PHYSIOGRAPHIC PROVINCE, WHICH CONSISTS OF ISOLATED MOUNTAIN RANGES SEPARATED BY AGGRADED DESERT PLAINS. THE VEGETATION OF THIS AREA IS CHARACTERIZED BY A MOSAIC OF COLD DESERT SHRUB COMMUNITIES OF SHADSCALE, GREASEWOOD, AND BIG SAGEBRUSH, DEPENDING ON SOIL SALINITY. ALKALI FLATS OF SALTGRASS OCCUR WITHIN THIS SHRUB MATRIX IN CONJUNCTION WITH NEAR-SURFACE GROUND WATER AND VERY SALINE-ALKALINE SOILS.

MOST OF THE AREA NEAR THE SITE CONSISTED OF SALTGRASS ALKALI FLATS PRIOR TO EXTENSIVE INDUSTRIAL DEVELOPMENT. CURRENTLY, THE COMBINATION OF DENSE PATCHES OF VEGETATION COVER AND PHYSICAL PROTECTION PROVIDED BY FILL MATERIAL SUPPLIES SUITABLE HABITAT FOR NUMEROUS ANIMAL SPECIES.

A DECEMBER 1983 BIRD COUNT LISTED 57 SPECIES ALONG THE JORDAN RIVER WITHIN SALT LAKE CITY. WATERFOWL, INCLUDING SEVERAL SPECIES OF DUCKS, HAVE BEEN REPORTED TO USE THE PONDS IN THE SITE AREA. THE AREA ALSO PROVIDES HABITAT FOR SEVERAL MAMMAL SPECIES.

THE STATE OF UTAH HAS CLASSIFIED THE SURPLUS CANAL AS CLASS 3C, 3D, AND

4, PROTECTING IT FOR NONGAME FISH AND OTHER AQUATIC ORGANISMS; FOR WATERFOWL, SHOREBIRDS, AND OTHER WATER-ORIENTED WILDLIFE; AND FOR AGRICULTURAL USES INCLUDING IRRIGATION OF CROPS AND STOCK WATERING. ANY AQUATIC ORGANISMS KNOWN TO INHABIT THE JORDAN RIVER IN THE SALT LAKE CITY VICINITY COULD POTENTIALLY INHABIT THE SURPLUS CANAL.

NO LISTED OR CANDIDATE THREATENED OR ENDANGERED SPECIES ARE KNOWN TO OCCUR IN THE VICINITY OF THE SITE.

#SHEA

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

ALL WASTE CKD DEPOSITED AT THE SITES WAS PRODUCED BY THE PORTLAND CEMENT PLANT LOCATED AT 619 WEST 700 SOUTH IN SALT LAKE CITY, UTAH, BETWEEN 1959 AND 1983. WHILE IT IS NOT DEFINITELY KNOWN WHEN THE FIRST WASTE CKD WAS PLACED IN THE WEST SITE, DISCUSSIONS WITH THE LAND OWNERS FIX THE DATE AT APPROXIMATELY 1965. DISPOSAL IN THE WEST SITE CONTINUED UNTIL ABOUT THE SPRING OF 1974 WHEN DEPOSITION IN THE AREA OF SITE 3 BEGAN. DISPOSAL AT SITE 3 WAS TERMINATED IN THE WINTER OF 1977/1978 AND ACTIVITIES WERE SHIFTED TO SITE 2. INITIALLY, THE MATERIAL WAS TRUCKED FROM THE PLANT AND DEPOSITED AT THE SITE IN DRY FORM. SUBSEQUENTLY, PRECIPITATION AND INTRUSIONS OF GROUND WATER RESULTED IN HYDRATION AND AGGLOMERATION OF THE WASTE CKD. DRY DUMPING AT SITE 2 WAS STOPPED IN DECEMBER 1980. DISPOSAL OF WASTE CKD AT SITE 2 WAS CONTINUED AS A WET SLURRY UNTIL SOMETIME BETWEEN MARCH 1982 AND DECEMBER 1983 WHEN ALL DISPOSAL ACTIVITY WAS STOPPED.

THE TOTAL VOLUME OF WASTE CKD AT SITES 2, 3 AND THE WEST SITE IS ESTIMATED TO BE 495,000 CUBIC YARDS. SITE 2 IS ESTIMATED TO CONTAIN 138,000 CUBIC YARDS, SITE 3 IS ESTIMATED TO CONTAIN 249,000 CUBIC YARDS, AND THE WEST SITE IS ESTIMATED TO CONTAIN 109,000 CUBIC YARDS OF WASTE CKD. WASTE CKD WAS NOT DEPOSITED IN THE WEST SITE IN HOMOGENEOUS THICKNESSES AS AT SITES 2 AND 3, BUT RATHER IN DISCONTINUOUS LAYERS OF VARYING THICKNESS. THE WEST SITE WASTE CKD IS INTERLAYERED AND MIXED WITH A VARIETY OF DEMOLITION RUBBLE, SOILS, SCRAP IRON, CONCRETE SLABS, ASPHALT, COMMON BRICK, ALUMINA KILN BRICKS, AND COMMON TRASH. IN ADDITION, A SMALL QUANTITY OF CHROMIUM-BEARING REFRACTORY BRICK (ABOUT 360 TONS), ARE MIXED WITH THE WASTE CKD ON THE SITE.

IN SEPTEMBER 1979, PORTLAND CEMENT COMPANY OF UTAH (PCU) WAS PURCHASED BY LONE STAR INDUSTRIES. IN SEPTEMBER 1984, SITES 2 AND 3 WERE PROPOSED FOR INCLUSION ON THE NATIONAL PRIORITIES LIST (NPL). LONE STAR HAD VOLUNTARILY STARTED ENVIRONMENTAL INVESTIGATIONS AT THE SITE IN APRIL 1984. THE INVESTIGATIONS WERE ORGANIZED AND EXPANDED UNDER A FORMAL REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS). THE RI/FS WORK PLAN WAS SUBMITTED TO THE STATE OF UTAH ON SEPTEMBER 24, 1985, AND WAS APPENDED TO A CONSENT DECREE WITH THE STATE. JUDGMENT BASED ON THAT CONSENT DECREE WAS ENTERED ON NOVEMBER 29, 1985. THE SITE WAS FORMALLY LISTED ON THE NPL ON JUNE 10, 1986. AN ADDITIONAL WORK PLAN TO COMPLETE THE RI/FS WAS APPENDED TO AN AMENDED PARTIAL CONSENT DECREE DATED FEBRUARY 13, 1989. ON JULY 26, 1989, EPA SENT A GENERAL NOTICE LETTER, WHICH IDENTIFIED POTENTIALLY RESPONSIBLE PARTIES (PRPS), TO LONE STAR INDUSTRIES, AND THE SITE LAND OWNERS, WILLIAMSEN INVESTMENT CO., LAWRENCE D. WILLIAMSEN, SIDNEY M. AND VEOMA H. HORMAN, AND HORMAN FAMILY TRUST.

#HCP

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

THE RI/FS REPORTS FOR THE PORTLAND CEMENT COMPANY SITES 2 AND 3 WERE RELEASED TO THE PUBLIC FOR COMMENT ON SEPTEMBER 13, 1989, AND A PUBLIC MEETING ANNOUNCING THE AVAILABILITY OF THE REPORTS FOR PUBLIC REVIEW WAS HELD ON SEPTEMBER 21, 1989. THE INITIAL PROPOSED PLAN FOR THE SITE WAS RELEASED FOR PUBLIC COMMENT ON OCTOBER 16, 1989. BECAUSE THE INITIAL PROPOSED PLAN DID NOT IDENTIFY A SPECIFIC OFF-SITE LOCATION FOR DISPOSAL OF THE WASTE CKD, A REVISED PROPOSED PLAN FOR THE SITE WAS ISSUED ON

MARCH 26, 1990. THE RI/FS REPORTS AND THE INITIAL AND REVISED PROPOSED PLANS ARE PART OF THE ADMINISTRATIVE RECORD FOR THE SITE AND WERE MADE AVAILABLE TO THE PUBLIC IN THREE INFORMATION REPOSITORIES. ONE INFORMATION REPOSITORY IS IN THE OFFICES OF THE UTAH BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION, ON THE FOURTH FLOOR OF THE CANNON HEALTH BUILDING AT 288 NORTH 1460 WEST, SALT LAKE CITY. THE OTHER INFORMATION REPOSITORIES ARE MAINTAINED AT THE CHAPMAN BRANCH OF THE SALT LAKE CITY PUBLIC LIBRARY AND AT THE OFFICES OF THE US EPA REGION VIII IN DENVER, COLORADO. THE NOTICE OF AVAILABILITY OF THE RI/FS REPORT WAS PUBLISHED IN THE DESERET NEWS AND THE SALT LAKE CITY TRIBUNE ON SEPTEMBER 11, 1989. THE NOTICE OF AVAILABILITY OF THE INITIAL AND REVISED PROPOSED PLANS WERE PUBLISHED IN THE SAME TWO NEWSPAPERS ON OCTOBER 17, 1989, AND MARCH 25, 1990, RESPECTIVELY.

A PUBLIC MEETING TO ANNOUNCE THE AVAILABILITY OF THE RI/FS REPORTS ON THE SITE FOR PUBLIC REVIEW WAS HELD ON SEPTEMBER 21, 1989. A PUBLIC COMMENT PERIOD ON THE INITIAL PROPOSED PLAN WAS HELD FROM OCTOBER 16 THROUGH NOVEMBER 6, 1989, AND A PUBLIC MEETING ON THE SAME DOCUMENT WAS HELD NOVEMBER 1, 1989. A 60-DAY PUBLIC COMMENT PERIOD ON THE REVISED PROPOSED PLAN WAS HELD FROM MARCH 26 THROUGH MAY 26, 1990. THE 30-DAY PUBLIC COMMENT PERIOD ORIGINALLY SET FOR THE REVISED PROPOSED PLAN WAS SCHEDULED TO END ON APRIL 26, 1990, BUT WAS EXTENDED ANOTHER 30 DAYS (THROUGH MAY 26) BY EPA IN RESPONSE TO A REQUEST FROM MAYOR PALMER DEPAULIS, MAYOR OF SALT LAKE CITY, UTAH. A PUBLIC MEETING ON THE REVISED PROPOSED PLAN WAS HELD APRIL 11, 1990. AT THESE TWO PUBLIC MEETINGS, REPRESENTATIVES FROM THE US EPA, THE STATE OF UTAH BUREAU OF SOLID AND HAZARDOUS WASTE, AND LONE STAR INDUSTRIES WERE EITHER PRESENT OR OFFERED COMMENTS. A RESPONSE TO THE COMMENTS RECEIVED DURING THE TWO PUBLIC COMMENT PERIODS FOR THE INITIAL AND REVISED PROPOSED PLANS IS INCLUDED IN THE RESPONSIVENESS SUMMARY, WHICH IS PART OF THIS ROD. AN ADDITIONAL PUBLIC MEETING WAS HELD ON JUNE 21, 1990, AFTER THE CLOSE OF THE PUBLIC COMMENT PERIOD, FOR THE PURPOSE OF INFORMING THE RESIDENTS OF MAGNA AND WEST VALLEY CITY CONCERNING THE SITE AND THE STATE'S PREFERRED ALTERNATIVE.

#SROU

4. SCOPE AND ROLE OF OPERABLE UNIT WITHIN SITE STRATEGY

THE PROBLEMS AT THE PORTLAND CEMENT SITE ARE COMPLEX. THIS ROD ADDRESSES REMEDIATION OF OPERABLE UNIT 1, WHICH INCLUDES WASTE CKD AND THE SEPARATION AND TEMPORARY STORAGE OF CODISPOSED CHROMIUM-BEARING REFRACTORY KILN BRICKS ON THE SITE. WASTE CKD ON THE SITE IS A THREAT TO HUMAN HEALTH AND THE ENVIRONMENT BECAUSE IT CONTAINS ELEVATED LEVELS OF CERTAIN HEAVY METALS AND OTHER INORGANIC CONTAMINANTS AND IS HIGHLY ALKALINE. THE MOST SIGNIFICANT HUMAN HEALTH AND ENVIRONMENTAL HAZARDS ARE: (1) INHALATION OF FUGITIVE DUST, (2) DIRECT CONTACT WITH WASTE CKD, AND (3) THERE IS ALSO CONTAMINANT MIGRATION FROM THE WASTE CKD TO THE UNDERLYING GROUND WATER, WHICH IS A POTENTIAL SOURCE OF DRINKING WATER AND OTHER BENEFICIAL USES.

THE PURPOSE OF THIS RESPONSE IS TO PREVENT CURRENT OR FUTURE HUMAN EXPOSURE TO THE WASTE CKD AND TO ELIMINATE THE SOURCE OF CONTAMINANT MIGRATION INTO THE GROUND WATER. ADDITIONALLY, THE REMOVAL OF THE WASTE CKD AND CODISPOSED CHROMIUM BRICKS WILL MAKE IT EASIER TO CHARACTERIZE THE EXTENT OF ANY REMAINING CONTAMINATION, INCLUDING GROUND WATER CONTAMINATION. AN ADDITIONAL OPERABLE UNIT(S) IS PLANNED FOR ANY REMAINING SOIL AND GROUNDWATER CONTAMINATION, AND WILL PROVIDE A FINAL RECORD OF DECISION FOR THE SITE.

#SSC

5. SUMMARY OF SITE CHARACTERISTICS

POTENTIALLY AFFECTED POPULATION AND ENVIRONMENTAL AREAS

LAND SURROUNDING THE SITE IS USED PRIMARILY FOR INDUSTRIAL AND COMMERCIAL PURPOSES. RESIDENTIAL AREAS ARE LOCATED EAST OF THE SITE, AND VACANT OR AGRICULTURAL LANDS ARE INTERSPERSED THROUGHOUT THE SURROUNDING AREA. THE SITE IS ZONED C-2 FOR CONTROLLED LOW DENSITY COMMERCIAL AND M-1 FOR LIGHT INDUSTRIAL USES, AND IS ALSO DESIGNATED TO BE WITHIN THE APPROACH ZONE FOR THE SALT LAKE CITY INTERNATIONAL AIRPORT. SALT LAKE PLANNING OFFICIALS REPORT THAT LIGHT INDUSTRIAL AND LOW DENSITY COMMERCIAL USE WILL BE ENCOURAGED IN THE VICINITY OF THE SITE. THE POPULATION WITHIN ONE-MILE OF THE SITE WAS ESTIMATED TO BE BETWEEN 6,000 AND 12,200.

NATURAL SOILS AT THE SITE ARE POORLY DRAINED, SALINE-ALKALI AFFECTED, WITH LIME ACCUMULATIONS AND PH VALUES OF 8.4 TO 9.6 UNITS. THE VICINITY ALSO INCLUDES OTHER FILL SOILS OR MATERIAL IN ADDITION TO THE WASTE CKD PLACED AT THE SITE. USES WERE GENERALLY LIMITED TO RANGE AND WILDLIFE HABITAT WITH SOME AREAS RECLAIMED FOR AGRICULTURE.

VOLUME, QUANTITIES AND CONCENTRATIONS OF CONTAMINANTS

CONSTITUENTS OF WASTE CKD INCLUDE OXYGEN, CALCIUM, SILICON, ALUMINUM, IRON, MAGNESIUM, MOLYBDENUM, SODIUM, AND POTASSIUM. WASTE CKD CONSTITUENTS WHICH ARE HAZARDOUS SUBSTANCES UNDER CERCLA SECTION 302.4 INCLUDE ARSENIC, CADMIUM, CHROMIUM, LEAD, AND ZINC. TABLE 5-1 COMPARES ELEMENTAL CONCENTRATION RANGES OF WASTE CKD FROM THE SITE WITH TYPICAL CONCENTRATION RANGES FOR WESTERN SOILS.

THE MAJOR CONSTITUENTS OF THE CHROMIUM-BEARING REFRACTORY KILN BRICKS TAKEN FROM SITE 3 ARE SILICA, MAGNESIUM, CALCIUM IRON, ALUMINUM, CHROMIUM, MANGANESE, ZINC, AND BARIUM, WITH LESSER AMOUNTS OF CADMIUM AND SILVER. TABLE 5-2 SHOWS ANALYTICAL RESULTS FROM SAMPLES OF KILN BRICKS. THE CHROMIUM-BEARING REFRACTORY KILN BRICKS (CHROME BRICKS OR CHROMIUM BRICKS) ARE A CHARACTERISTIC HAZARDOUS WASTE UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA).

EXTENT OF CONTAMINATION AND AFFECTED MEDIA

WASTE CKD WAS DEPOSITED IN ALL THREE AREAS OF THE SITE--SITE 2, SITE 3, AND THE WEST SITE. THERE ARE DIFFERENCES IN THE NATURE OF THE WASTE DISPOSED AT EACH AREA. THE WASTE CKD AT SITES 2 AND 3 IS UNIFORM AND HOMOGENEOUS COMPARED TO THE WASTE CKD IN THE WEST SITE. THE WASTE CKD AT SITES 2 AND 3 WAS PLACED IN A SINGLE RELATIVELY THIN LIFT AND IS FULLY EXPOSED AT THE SURFACE. WASTE CKD AT THE WEST SITE IS PRESENT IN SEVERAL FORMS: IT IS PURE, MIXED WITH SOIL, AND INTERMIXED WITH SOIL AND RUBBLE. SOME OF THESE WASTE CKD MATERIALS ARE EXPOSED AT THE EXISTING GROUND SURFACE WHILE OTHERS ARE ENCOUNTERED BELOW SURFACE FILL. FIGURE 1-2 SHOWS THE LOCATIONS OF WASTE CKD DISPOSAL SITES. THE EXACT DISTRIBUTION AND EXTENT OF THE MIXED AND BURIED MATERIALS AT THE WEST SITE ARE NOT FULLY DEFINED. HOWEVER, BASED ON INFORMATION DEVELOPED IN THE REMEDIAL INVESTIGATION THESE MATERIALS ARE DISCONTINUOUS AND COULD EXIST IN POCKETS. THE WASTE CKD ON SITE 2 WAS DISPOSED AS A SLURRY, WHEREAS THE WASTE ON SITE 3 WAS DISPOSED IN A DRY FORM. CADMIUM, CHROMIUM, HEXAVALENT CHROMIUM, LEAD, MOLYBDENUM, ARSENIC, AND ELEVATED PH WERE DETECTED THROUGHOUT SITES 2 AND 3 AND THE WEST SITE, WITH LITTLE VARIATION BETWEEN THE SITES.

AREAS OF SUSPECTED WASTE CKD HAVE ALSO BEEN NOTED ALONG CITY DRAIN. A FIELD SURVEY OF CITY DRAIN SHOWED THAT BARREN, LIGHT-COLORED SOILS WERE APPARENT ALONG THE BANK AT FOUR LOCATIONS. SINCE CITY DRAIN WAS CONSTRUCTED PRIOR TO THE PLACEMENT OF WASTE CKD FILL MATERIAL, IT IS THOUGHT THAT THE SUSPECT MATERIAL IS NOT EXPOSED WASTE CKD. ALTERNATIVELY, THE OCCURRENCE OF THE PURPORTED WASTE CKD ALONG CITY DRAIN MAY BE THE RESULT OF ISOLATED DUMPINGS OF MATERIAL ALONG THE EMBANKMENT. IN EITHER CASE, THE TOTAL VOLUME OF POSSIBLE WASTE CKD ALONG CITY DRAIN EMBANKMENTS APPEARS TO BE SMALL.

A FIELD SURVEY WAS PERFORMED TO DISCOVER AREAS OF ERODED WASTE CKD DEPOSITION WHICH WOULD INDICATE THAT WASTE CKD COULD BE MIGRATING

OFF-SITE. DEPOSITIONAL AREAS WERE FOUND ALONG THE NORTH, EAST, AND SOUTH SIDES OF SITE 2. MOST OF THE EROSION APPEARS TO OCCUR AS SHEET OR RILL EROSION, ALTHOUGH A SHALLOW DRAINAGE CHANNEL HAS BEEN EXCAVATED ALONG THE WEST BOUNDARY OF THE LINK TRUCKING PROPERTY WHICH HAS PROMOTED GULLY EROSION INTO CITY DRAIN AT THAT LOCATION.

DETAILED VISUAL OBSERVATIONS OF PONDED WATER AT THE SITE WERE MADE ON A REGULAR BASIS BEGINNING IN APRIL 1984, AN EXTREMELY WET SPRING, WHEN THE GREATEST AREAL EXTENT OF PONDED WATER WAS RECORDED. AREAS OF PONDED WATER NOTED INCLUDED A LARGE AREA ON THE SOUTHERN BOUNDARIES OF SITES 2 AND 3, SEVERAL AREAS ON THE NORTHERN EDGES OF SITES 2 AND 3, AND SEVERAL AREAS WITHIN SITE 3. A SUMMARY OF THE ANALYTICAL RESULTS FOR SAMPLES COLLECTED FROM PONDED WATER IS SHOWN IN TABLE 5-3. AT THE TIME, THE ONLY KNOWN INCIDENT OF OFF-SITE DISCHARGE OF PONDED WATER WAS NOTED FROM THE AREA OF PONDED WATER ALONG THE NORTH SIDE OF SITE 3. WATER WAS OBSERVED FLOWING OFF-SITE THROUGH A CULVERT AT THE JUNCTION OF THE UNION PACIFIC RAILROAD TRACKS AND INDIANA AVENUE BUT WAS NOT SAMPLED TO CHARACTERIZE ITS CHEMICAL CHARACTERISTICS. THIS CULVERT DRAINS INTO A DITCH WHICH FLOWS WEST INTO CITY DRAIN. DURING THE PHASE II REMEDIAL INVESTIGATION PONDED WATER WAS PRESENT IN THE NORTH BOUNDARY DITCH ALONG SITE 3. THIS WATER ORIGINATED PRIMARILY FROM SNOWMELT, ALTHOUGH ANALYSES SHOW THAT THE POND MAY ALSO RECEIVE SEEPAGE FROM THE WASTE CKD.

THREE ROUNDS OF WATER SAMPLES WERE TAKEN FROM THE SURPLUS CANAL AND THE CITY DRAIN AT LOCATIONS UPGRADIENT AND DOWNGRADIENT OF THE SITE DURING PHASE I OF THE REMEDIAL INVESTIGATION. THE SURPLUS CANAL GENERALLY ACTS AS A RECHARGE BOUNDARY FOR THE GROUND WATER IN THE AREA, THUS GREATLY REDUCING THE POSSIBILITY OF DEGRADATION OF THE SURPLUS CANAL BY GROUND WATER EMANATING FROM WITHIN THE SITE. NO INCREASE IN CONCENTRATION OF ANY PARAMETER WAS SEEN IN THE SURFACE WATER.

CITY DRAIN SURFACE WATER SAMPLES COLLECTED DURING THE PHASE II RI SHOWED INCREASES IN CHLORIDE, SULFATE, PH, TDS, AND MOLYBDENUM CONCENTRATIONS AT THE DOWNSTREAM SITE BOUNDARY. WITH THE EXCEPTION OF MOLYBDENUM, THESE INCREASES MAY INDICATE THE DISCHARGE OF WATER FROM THE SITE INTO THE CITY DRAIN. THE PRESENCE OF MOLYBDENUM CONFIRMS THAT GROUND WATER FROM THE SITE DISCHARGES TO THE CITY DRAIN. NO SIGNIFICANT INCREASES IN OTHER TRACE METALS WERE OBSERVED AT THE DOWNSTREAM BOUNDARY.

SEDIMENT SAMPLES WERE COLLECTED AT THE SAME LOCATIONS WHERE THE CITY DRAIN AND NORTH BOUNDARY DITCH SURFACE WATER SAMPLING WAS CONDUCTED. THE SAMPLING WAS CONDUCTED IN ORDER TO EVALUATE THE POTENTIAL EFFECTS OF CONSTITUENT MIGRATION INTO EACH OF THE SURFACE WATER BODIES, EITHER AS EROSION OF WASTE CKD OR SEEPAGE AND PRECIPITATION OF CONSTITUENTS. IN SEDIMENT SAMPLES FROM THE CITY DRAIN, ARSENIC WAS REPORTED IN A RANGE OF 14 TO 39 MG/KG, CHROMIUM WAS REPORTED AT 3.3 TO 28 MG/KG, AND LEAD WAS REPORTED AT 38 TO 270 MG/KG.

IN SEDIMENT SAMPLES COLLECTED IN THE NORTH BOUNDARY DITCH, THE MEAN MOLYBDENUM CONCENTRATION AT SW3-2C (SEE FIGURE 5-1) EXCEEDED THE NORMAL TRACE ELEMENT CONCENTRATIONS IN SOILS. ALL OTHER MEAN VALUES WERE WITHIN RANGES COMMONLY OBSERVED IN SOILS. QUALITATIVE COMPARISONS OF THE SAMPLE RESULTS SUGGEST THAT CHROMIUM, LEAD, POTASSIUM, MOLYBDENUM, AND PH ARE ELEVATED IN THE SAMPLES FROM SW3-2B. THE MEAN VALUE OF CHROMIUM AT SW3-2B IS 107 MG/KG COMPARED TO APPROXIMATELY 20 MG/KG AT THE OTHER TWO SAMPLE LOCATIONS. THE MEAN VALUE OF LEAD IS 198 MG/KG AT SW3-2C COMPARED TO 112 TO 150 MG/KG AT THE OTHER TWO SAMPLE LOCATIONS.

PHYSICAL-CHEMICAL PROPERTIES AND ENVIRONMENTAL FATE OF CHEMICALS OF CONCERN

THE PHYSICAL-CHEMICAL PROPERTIES AND THE ENVIRONMENTAL FATE OF CHEMICALS OF CONCERN, INCLUDING MOBILITY AND PREVALENCE, ARE DISCUSSED BELOW.

ARSENIC

ARSENIC IS A NATURALLY OCCURRING METAL THAT CAN BE PRESENT IN EITHER AN INORGANIC OR ORGANIC FORM. GENERALLY, ARSENIC IS READILY SORBED ONTO

CLAY PARTICLES; HOWEVER, UNDER VERY HIGH PH CONDITIONS (SUCH AS AT THE SITE) ADSORPTION TENDS TO DECREASE, RESULTING IN INCREASED MOBILITY. IN CLAY SOILS, ARSENIC HAS A LOW TO MODERATE MOBILITY.

IN THE ATMOSPHERE, ARSENIC DISPERSION AND DEPOSITION IS DEPENDENT ON LOCAL METEOROLOGY AND THE SIZE OF THE PARTICLES. THE AVERAGE ANNUAL ATMOSPHERIC CONCENTRATION OF ARSENIC IS 0.003 MG/M3. IN THE AQUATIC ENVIRONMENT, ARSENIC IS PARTITIONED INTO SEDIMENTS VIA SORPTION ONTO CLAY MINERALS. UNDER HIGH PH CONDITIONS, ARSENIC IS LIKELY TO REMAIN DISSOLVED IN SOLUTION. NEUTRALIZATION RESULTS IN A CHANGE IN VALENCE STATE FROM +5 TO +3 AND PRECIPITATION TO SEDIMENT.

ARSENIC DOES NOT APPEAR TO ACCUMULATE SIGNIFICANTLY IN AQUATIC ORGANISMS. IN GENERAL, ARSENIC IS FOUND IN GREATER CONCENTRATIONS IN LOWER FOOD CHAIN ORGANISMS (BACTERIA) THAN IN HIGHER ORGANISMS (FISH), PRIMARILY BECAUSE OF THE GREATER SURFACE AREA TO VOLUME RATIO IN LOWER ORGANISMS. ACCUMULATED ARSENIC IN HIGHER AQUATIC ORGANISMS IS READILY TRANSFORMED TO LESS TOXIC ARSENIC FORMS AND EXCRETED.

CADMIUM

CADMIUM OCCURS IN NATURE IN THE ZERO AND +2 VALENCE STATES. IN THE +2 STATE, CADMIUM READILY FORMS COMPLEXES WITH AMMONIA, CYANIDES, AND HALIDES. THE DOMINANT FATE OF CADMIUM IN THE AQUATIC ENVIRONMENT IS SEDIMENTATION THROUGH SORPTION ONTO CLAYS OR ORGANIC MATTER AND COPRECIPITATION. LESSER AMOUNTS OF CADMIUM MAY PERSIST IN THE AQUATIC PHASE IN SOLUTION, EITHER AS HYDRATED CATIONS OR ORGANIC COMPLEXES. THE MAJORITY OF CADMIUM IN NATURAL WATER IS EXPECTED TO EXIST AS THE HYDRATED CATION.

THE FATE OF CADMIUM IN THE SOIL IS SIMILAR TO ITS AQUATIC FATE. CADMIUM IS SORBED READILY TO SOIL WITH INCREASED SORPTION AS THE ORGANIC MATTER CONTENT OF SOIL INCREASES. AT EXTREME LOW PH CONDITIONS, CADMIUM IS EXPECTED TO MOVE MORE READILY THROUGH THE SOIL.

CADMIUM IS REMOVED FROM THE ATMOSPHERE THROUGH DEPOSITION. THE ATMOSPHERIC HALF-LIFE DEPENDS ON PARTICLE SIZE DISTRIBUTION AND THE FORM OF CADMIUM.

CHROMIUM

CHROMIUM IS A NATURALLY OCCURRING METAL, USUALLY PRESENT IN A VALENCE STATE OF +3 OR +6. IN STRONGLY BASIC CONDITIONS (SUCH AS THOSE TYPICAL AT THE SITE) THE HEXAVALENT (+6) FORM PREDOMINATES. HEXAVALENT CHROMIUM IS A STRONG OXIDIZING AGENT AND IS READILY SOLUBLE IN NATURAL WATER. TRIVALENT (+3) CHROMIUM GENERALLY FORMS STABLE COMPLEXES WITH NEGATIVELY CHARGED SPECIES READILY ABSORBING TO CLAY PARTICLES. IN THE ATMOSPHERE, CHROMIUM IS REMOVED BY FALLOUT AND PRECIPITATION. TYPICAL ATMOSPHERIC CHROMIUM CONCENTRATIONS RANGE FROM 0.01 MG/M3 TO 0.03 MG/M3 IN URBAN AREAS.

THE MOBILITY OF CHROMIUM IN GROUND AND SURFACE WATER IS HIGHLY PH DEPENDENT. UNDER THE BASIC CONDITIONS OF THE SITE, CHROMIUM IS TYPICALLY MOBILE IN WATER. CHROMIUM (VI) MAY REDUCE TO CHROMIUM (III), DEPENDING ON THE AVAILABILITY OF OXIDIZABLE MATERIALS SUCH AS ORGANIC MATTER. CHROMIUM (III) WILL PRECIPITATE OR REMAIN IN SOLUTION AS SOLUBLE COMPLEXES. CONCENTRATIONS OF CHROMIUM IN US RIVERS RANGE BETWEEN 1 AND 30 MG/L.

LEAD

LEAD IS A NATURALLY OCCURRING ELEMENT EXISTING IN THREE OXIDATION STATES: 0, +2, +4. NATURALLY OCCURRING LEAD COMPOUNDS ARE GENERALLY INSOLUBLE, READILY SORBING ONTO CLAY PARTICLES OR ORGANIC MATTER.

IN THE ATMOSPHERE, LEAD EXISTS PRIMARILY IN PARTICULATE FORM. SETTLING AND TRANSPORT OF LEAD ARE AFFECTED PRIMARILY BY PARTICLE SIZE. LEAD CONCENTRATIONS RANGE FROM 0.0001 MG/M3 IN THE ATMOSPHERE IN RURAL AREAS TO 10 MG/M3 IN URBAN AREAS.

THE CONCENTRATION OF SOLUBLE LEAD IN WATER IS RELATED TO THE PH, OXIDIZING POTENTIAL OF WATER, PRESENCE OF COMPETING METALS (CA+, MG+, FE+), AND THE EXISTENCE OF COMPLEXING AND PRECIPITATING AGENTS. UNDER HIGH PH CONDITIONS, LEAD IS EXPECTED TO BE MORE READILY SOLUBLE. ONCE NEUTRALIZED, HOWEVER, LEAD IS EXPECTED TO REMAIN IN THE UNDISSOLVED FORM EITHER AS SORBED OR SURFACE COATINGS ON MINERAL PARTICLES. BECAUSE LEAD READILY SORBS ONTO SOIL PARTICLES, EROSION TRANSPORT OF LEAD AND OTHER METALS DURING RUNOFF CAN OCCUR.

LEAD IS PRESENT IN NEARLY ALL AQUATIC SPECIES WITH PRIMARY UPTAKE BY INGESTION OF SUSPENDED PARTICULATE MATTER CONTAINING ABSORBED OR COMPLEXED LEAD. LOWER SPECIES TEND TO ACCUMULATE LEAD MORE READILY THAN HIGHER ORGANISMS AND HERBIVORES ACCUMULATE LEAD MORE READILY THAN CARNIVORES.

TOXICITY OF WASTE CKD AND CHEMICALS OF CONCERN

WASTE CEMENT KILN DUST

THE CONSTITUENTS OF HUMAN HEALTH CONCERN IN WASTE CKD ARE CALCIUM HYDROXIDE, CRYSTALLINE SILICA, AND HEAVY METALS, INCLUDING THE METALS DESCRIBED IN THIS SECTION. SILICA EXISTS IN SEVERAL FORMS; HOWEVER, ONLY THE CRYSTALLINE FORMS PRODUCE THE CHRONIC PULMONARY FIBROSIS KNOWN AS SILICOSIS. THERE IS NO INFORMATION AVAILABLE REGARDING ADVERSE EFFECTS FROM INGESTION EXPOSURE OF SILICA. THE WASTE CKD AT THE SITE WAS ANALYZED FOR ITS CRYSTALLINE SILICA CONTENT. RESULTS INDICATE THAT THE WASTE CKD FROM SITES 2 AND 3 CONTAINS APPROXIMATELY 4-6 PERCENT CRYSTALLINE SILICA.

THE OSHA STANDARD FOR PORTLAND CEMENT EXPOSURE ASSUMES THAT THE CRYSTALLINE QUARTZ (COMPOSED OF ALMOST 100 PERCENT SILICA) CONTENT IS APPROXIMATELY 1 PERCENT OR LESS. THE OSHA STANDARD FOR RESPIRABLE CRYSTALLINE QUARTZ DUST IS 10 MG/M3. THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS RECOMMENDS A THRESHOLD LIMIT VALUE OF 0.1 MG/M3 FOR RESPIRABLE QUARTZ, WHILE THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) RECOMMENDS A 50 MG/M3 (10 HOUR TIME-WEIGHTED AVERAGE) FOR RESPIRABLE FREE CRYSTALLINE SILICA.

WASTE CKD CONTAINS SEVERAL ALKALINE MATERIALS SUCH AS CALCIUM HYDROXIDE (SLAKED LIME). CALCIUM OXIDE REACTS EXOTHERMICALLY WITH WATER TO PRODUCE CALCIUM HYDROXIDE. THIS MATERIAL IN DIRECT CONTACT WITH SKIN OR MUCOUS MEMBRANES CAN RESULT IN BURNS AND SEVERE IRRITATION. CALCIUM HYDROXIDE IS CLASSIFIED AS A PRIMARY SKIN IRRITANT THAT PRODUCES ACUTE ECZEMATOUS CONTACT DERMATITIS. THE SIGNS OF CONTACT DERMATITIS INCLUDE SENSATION OF BURNING, ITCHING, REDNESS AND SWELLING. THERE IS ALSO SPECIAL CONCERN OVER EXPOSURE TO THE EYES. THE WASTE CKD MAY REACT WITH THE MOISTURE AND PROTEIN FOUND IN THE EYE TO FORM CLUMPS OF MOIST COMPOUND WHICH ARE VERY DIFFICULT TO REMOVE BY NORMAL IRRIGATION. SUCH CLUMPS TEND TO LODGE DEEP IN THE CUL-DE-SACS AND ACT AS RESERVOIRS FOR THE LIBERATION OF CA(OH)2 OVER LONG PERIODS OF TIME. THE AVAILABLE LITERATURE ON OCCUPATIONAL DERMATOSES DOES NOT PROVIDE INFORMATION FOR DEVELOPING QUANTITATIVE NO-EFFECT LEVELS BASED ON EITHER PH OR ION CONCENTRATION IN WATER.

NO-EFFECT LEVELS FOR WASTE CKD IN AIR ARE BASED LARGELY ON THE CRYSTALLINE SILICA LEVELS. IRRITATION DUE TO THE ALKALINE MATERIALS OCCURS AT MUCH HIGHER CONCENTRATIONS, AND IS NOT AS IMPORTANT A FACTOR AS THE SILICA MATERIALS IN ESTABLISHING NO-EFFECT LEVELS IN AIR.

ARSENIC

AVAILABLE DATA SUGGEST THAT ARSENIC COMPOUNDS ARE READILY ABSORBED IN THE GASTROINTESTINAL TRACT. THE HALF LIFE OF ARSENIC IN THE BODY IS APPROXIMATELY 10 HOURS, WITH THE ARSENIC BEING LARGELY EXCRETED IN THE URINE. THE SYSTEMIC TOXICITY OF ARSENIC IS LARGELY ASSOCIATED WITH EFFECTS TO SULFHYDRYL-CONTAINING ENZYMES. TRIVALENT ARSENIC IS THE PRINCIPAL TOXIC FORM; PENTAVALENT ARSENIC APPEARS TO HAVE LITTLE EFFECTS

ON SULFHYDRYL-CONTAINING ENZYMES. ARSENIC ALSO INHIBITS OXIDATIVE PHOSPHORYLATION AND OTHER PROCESSES RELATING TO CELLULAR RESPIRATION.

NUMEROUS STUDIES HAVE INDICATED THAT HIGH LEVELS OF EXPOSURE TO ARSENIC ARE CARCINOGENIC IN MAN. CANCERS OF THE SKIN, LIVER, AND ENDOTHELIAL LININGS OF THE BLOOD VESSELS AND THE LIVER HAVE BEEN DOCUMENTED FROM OCCUPATIONAL EXPOSURE. EXPOSURES TO ARSENIC IN DRINKING WATER HAVE BEEN ASSOCIATED WITH INCREASED INCIDENCE OF SKIN CANCER. THE RELATIONSHIPS OF INGESTION OF ARSENIC TO SKIN CANCER, AND OF INHALATION TO LUNG CANCER, ARE SUFFICIENT TO ESTABLISH ARSENIC AS A HUMAN CARCINOGEN. EPA HAS JUDGED ARSENIC TO BE CARCINOGENIC BY INGESTION AND INHALATION, BASED ON OCCUPATIONAL EXPOSURES OF COPPER SMELTER WORKERS (INHALATION) AND INGESTION EXPOSURES OF ARSENIC-CONTAMINATED DRINKING WATER.

CADMIUM

THE PRIMARY HUMAN HEALTH CONCERNS ASSOCIATED WITH CADMIUM EXPOSURE ARE KIDNEY DYSFUNCTION AND, WHEN INHALED, CARCINOGENICITY. THERE IS NO EVIDENCE FOR CARCINOGENICITY OF INGESTED CADMIUM. EPA'S CARCINOGEN ASSESSMENT GROUP (CAG) SUGGESTS THAT CADMIUM BE CONSIDERED A PROBABLE HUMAN CARCINOGEN BASED ON LUNG CANCER RATES OBSERVED IN SMELTER WORKERS AS WELL AS LABORATORY ANIMALS. EMPHYSEMA HAS ALSO BEEN DOCUMENTED AS A HEALTH EFFECT RESULTING FROM CHRONIC OCCUPATIONAL INHALATION OF CADMIUM.

CADMIUM ABSORPTION IN THE BODY VARIES WITH THE TYPE OF EXPOSURE. TYPICALLY, INHALATION RESULTS IN 25 PERCENT ABSORPTION WHEREAS INGESTION RESULTS IN ONLY 5 TO 6 PERCENT ABSORPTION. EPA HAS DETERMINED THAT HUMAN EXPOSURE TO CADMIUM OCCURS PRIMARILY FROM DIETARY INTAKE WITH MUCH LESS EXPOSURE VIA DRINKING WATER AND AMBIENT AIR INHALATION.

CUMULATIVE EXPOSURE TO CADMIUM IS OF GREAT CONCERN SINCE BODY BURDENS OF CADMIUM ARE KNOWN TO INCREASE STEADILY FROM BIRTH. ONCE ABSORBED INTO THE BODY, CADMIUM DEPURATION IS SLOW. CADMIUM'S HALF-LIFE IN THE BODY IS APPROXIMATELY 18 TO 38 YEARS.

CHROMIUM

SEVERAL EPIDEMIOLOGICAL STUDIES HAVE INDICATED THAT HEXAVALENT CHROMIUM IS CARCINOGENIC IN THE LUNG. THE CANCER RISK IS ASSOCIATED LARGELY WITH SOLUBLE HEXAVALENT CHROMIUM COMPOUNDS. TRIVALENT CHROMIUM COMPOUNDS ARE CONSIDERED MUCH LESS TOXIC THAN HEXAVALENT COMPOUNDS, AND HAVE NOT BEEN ASSOCIATED WITH CARCINOGENIC EFFECTS. HEXAVALENT CHROMIUM IS SEVERELY IRRITATING AND CAUSES CHRONIC ULCERATION OF THE SKIN AND NASAL SEPTUM, AT OCCUPATIONAL EXPOSURE LEVELS. AT LOW LEVELS OF EXPOSURE TO THE PUBLIC, HOWEVER, THE GREATEST CONCERN IS THE POTENTIAL CANCER RISK. EPA HAS JUDGED HEXAVALENT CHROMIUM TO BE CARCINOGENIC IN HUMANS BY INHALATION, BASED ON EPIDEMIOLOGICAL STUDIES OF LUNG CANCER IN CHROMATE WORKERS. IT IS UNLIKELY, HOWEVER, THAT HEXAVALENT CHROMIUM IS CARCINOGENIC BY INGESTION.

LEAD

HUMAN EXPOSURE TO LEAD RESULTS IN ADVERSE IMPACTS TO THE KIDNEY, NERVOUS SYSTEM AND HEMATOPOIETIC SYSTEM. ACCUMULATION TAKES PLACE PRIMARILY IN BONES AND OTHER HARD TISSUES AND TO A LESSER DEGREE IN SOFT TISSUE AND BLOOD. INGESTION IS THE PRIMARY ROUTE OF EXPOSURE TO LEAD. ABSORPTION EFFICIENCY DEPENDS ON A NUMBER OF FACTORS, AMONG THE MOST IMPORTANT OF WHICH IS CALCIUM AND IRON DEFICIENCY. LEAD IS MORE READILY ABSORBED IF THESE MINERALS ARE DEFICIENT IN THE DIET.

THE PRIMARY HUMAN HEALTH CONCERN WITH LOW-LEVEL LEAD EXPOSURE IS NEURO-BEHAVIORAL EFFECTS FROM EXPOSURE IN UTERO AND IN CHILDHOOD; THE FETUS AND YOUNG CHILDREN REPRESENT THE MOST SENSITIVE POPULATIONS FOR LEAD EXPOSURE. EXPOSURES TO LOW LEVELS OF LEAD BY CHILDREN AND PREGNANT WOMEN REPORTEDLY HAVE RESULTED IN MEASURABLE REDUCTIONS IN STANDARDIZED TESTS OF COGNITIVE ABILITY, REDUCED BIRTH WEIGHT AND PREMATURE BIRTHS. EXISTING STANDARDS FOR LEAD EXPOSURE, SUCH AS THE NATIONAL AMBIENT AIR

QUALITY STANDARD (1.5 MG/M3) AND THE SAFE DRINKING WATER ACT MAXIMUM CONTAMINANT LEVEL (50 MG/L) ARE INTENDED TO MAINTAIN BLOOD-LEAD LEVELS BELOW 30 MG/DL, WHICH HAS BEEN HISTORICALLY CONSIDERED A NO-ADVERSE-EFFECTS-LEVEL (NOAEL) FOR LEAD. DATA DEVELOPED BY THE CENTERS FOR DISEASE CONTROL (CDC) IN 1985 HAVE INDICATED THAT ENZYMATIC CHANGES IN RED BLOOD CELLS AND COGNITIVE DEFICITS MAY BE ASSOCIATED WITH BLOOD-LEAD LEVELS OF 25 UG/DL. IN A 1988 REPORT TO CONGRESS, ATSDR HAS REPORTED ADVERSE HEALTH EFFECTS ASSOCIATED WITH BLOOD-LEAD LEVELS AS LOW AS 10-15 UG/DL. THE TARGET BLOOD-LEAD LEVEL USED IN DEVELOPING CLEAN-UP GOALS FOR THIS SITE WAS 12.5 UG/DL. THE PROPOSED MAXIMUM CONTAMINANT LEVEL GOAL (MCLG) IS 5 UG/L IN WATER, REFLECTING RECENT CONCERNS ABOUT NO-EFFECT LEVELS FOR LEAD EXPOSURE.

VARIOUS FACTORS AFFECT THE AQUATIC TOXICITY OF LEAD INCLUDING: HARDNESS OF WATER, OXYGEN CONTENT, PH AND INTERACTION WITH OTHER METALS. UNDER HIGH PH CONDITIONS, TOXICITY IS GENERALLY GREATER SINCE MORE LEAD IS AVAILABLE IN THE DISSOLVED STATE.

MOLYBDENUM

A COMPLEX RELATIONSHIP EXISTS BETWEEN MOLYBDENUM AND COPPER IN THE NUTRITION OF LIVESTOCK. MOLYBDENUM IS TOXIC IN CATTLE AND SHEEP IN DIETS DEFICIENT IN COPPER, WHEREAS DIETS HIGH IN COPPER, AND LOW IN MOLYBDENUM CAN POTENTIALLY RESULT IN COPPER TOXICITY. MOLYBDENUM TOXICITY CAN BE EXPECTED IN CATTLE WHEN THE RATIO OF COPPER TO MOLYBDENUM IN THE DIET DROPS BELOW 2:1. THE EFFECTS INCLUDE EMACIATION, DIARRHEA, ANEMIA, AND POOR WEIGHT GAIN. PROLONGED EXPOSURE MAY RESULT IN OSTEOPOROSIS AND BONE FRACTURES. WHEN COPPER LEVELS IN FEED OR FORAGES ARE IN THE NORMAL RANGE OF 8 TO 11 PPM, CATTLE CAN BE POISONED BY MOLYBDENUM CONCENTRATIONS OF 5 TO 6 PPM AND SHEEP POISONED AT CONCENTRATIONS ABOVE 10 TO 12 PPM. WHEN DIETARY COPPER FALLS BELOW 8 PPM, MOLYBDENUM CONCENTRATIONS OF 1 TO 2 PPM MAY BE TOXIC TO CATTLE. INCREASING DIETARY COPPER EVEN 5 PPM ABOVE NORMAL WILL PROTECT CATTLE AGAINST 150 PPM DIETARY MOLYBDENUM. NONRUMINANTS SUCH AS PIGS ARE MUCH MORE TOLERANT TO MOLYBDENUM EXPOSURE THAN RUMINANTS.

CONTAMINANT MIGRATION PATHWAYS

AIR PATHWAY

WIND-BLOWN DUST HAS BEEN OBSERVED EMANATING FROM THE SITE DURING HIGH WIND EPISODES. TWO TECHNIQUES HAVE HISTORICALLY BEEN APPLIED TO MITIGATE THE POTENTIAL FOR WIND-BLOWN DUST: SLURRYING OF THE WASTE CKD DURING DISPOSAL, AND MORE RECENTLY THE PERIODIC APPLICATION OF DUST SUPPRESSANT (AMSCO-RES 661). WIND-BLOWN DUST FROM THE SITE HAS SEASONALLY BEEN INHIBITED BY THE MOIST CONDITIONS AND NATURAL CRUSTING PROPERTIES OF THE WASTE CKD. APPLICATION OF THE DUST SUPPRESSANT ENFORCES THE FORMATION OF A CRUST WHICH BOTH ENABLES THE MATERIAL BELOW THE CRUST TO RETAIN MOISTURE AND INCREASES THE THRESHOLD TO WIND EROSION.

IN ORDER TO INVESTIGATE THE SURFACE CHEMISTRY OF WASTE CKD, THE SAMPLES COLLECTED TO DETERMINE THE DRY AGGREGATE STRUCTURE WERE ALSO SUBJECTED TO ADDITIONAL CHEMICAL ANALYSES. THE CHEMICAL ANALYSIS WAS PERFORMED ON BOTH THE ENTIRE AGGREGATE SAMPLE AND ON THE MASS FRACTION PASSING THE FINEST SIEVE (53 UM).

THE CONCENTRATIONS OF CHEMICAL CONSTITUENTS CONTAINED IN THE SIZE FRACTION LESS THAN 53 M OF THE SURFACE WASTE CKD ARE CONTRASTED TO THE MEAN OF ANALYSES DERIVED FROM CORE SAMPLES (TABLE 5-4). LEAD, MOLYBDENUM, AND ARSENIC WERE FOUND TO BE SUBSTANTIALLY LOWER IN THE SURFACE MATERIALS THAN IN THE CORE SAMPLES. IN ADDITION, THE PH OF THE SURFACE SAMPLES RANGED FROM 9.9 TO 10.1 AS COMPARED WITH A MEAN VALUE OF 12.1 OBSERVED IN THE CORE SAMPLES.

THE MOISTURE CONTENT OF THE TOP 10 CM OF THE WASTE CKD DRIES TO THE WILTING POINT DURING MAY AND GENERALLY DOES NOT BEGIN TO BE REPLENISHED UNTIL SOMETIME IN DECEMBER. THIS PERIOD OF THE YEAR HAS HISTORICALLY

CORRESPONDED TO PERIODS WHEN WIND-BLOWN DUST HAS BEEN VISUALLY OBSERVED EMANATING FROM THE SITE DURING HIGH WIND EVENTS. DURING THE FIVE-MONTH DECEMBER TO APRIL PERIOD, THE MATERIALS ONSITE ARE EXPECTED TO BE SATURATED. THIS PERIOD ALSO CORRESPONDS TO THE PERIOD WHEN SNOW COVER WOULD REDUCE EMISSIONS.

SURFACE AND UPPER AIR OBSERVATIONS WERE OBTAINED FROM SALT LAKE CITY AIRPORT DURING THE SIX YEAR PERIOD FROM 1981 THROUGH 1986. WIND ROSES WERE CONSTRUCTED FOR THE YEARS 1981 TO 1986. THE WIND REGIMES FOR THESE YEARS ALL EXHIBIT STRONG BI-MODAL PATTERNS WITH PREVAILING WINDS USUALLY BEING FROM THE SOUTH-SOUTHEAST OR FROM THE NORTH-NORTHWEST.

THE SPATIAL PATTERNS OF WIND-BLOWN DUST CONCENTRATIONS FROM THE SITE, WHERE IT WAS ASSUMED THAT NO DUST SUPPRESSANT WAS USED TO CONTROL DUST EMISSIONS, WERE EXAMINED BY CONSTRUCTING CONTOUR PLOTS OF COMPUTER MODEL PREDICTIONS. THE SPATIAL DISTRIBUTION OF THE MODEL PREDICTIONS CLOSELY FOLLOWS THE ALIGNMENT OF THE PREVAILING WINDS. PREDICTED PARTICULATE LEVELS GENERALLY FALL OFF RAPIDLY IN THE EAST-WEST DIRECTION DUE TO THE RELATIVE INFREQUENT OCCURRENCE OF WIND SPEEDS ABOVE THE THRESHOLD FOR WIND EROSION.

CONCENTRATIONS BELOW EPA'S SIGNIFICANT IMPACTS LEVELS (SILS) ARE CONSIDERED BY THE EPA TO BE INSIGNIFICANT DURING THE REGULATORY PERMITTING PROCESS. THE 24-HOUR SIL SUGGESTED FOR THE 10 MICRON SIZE FRACTION (PM10) IS 5 UG/M3. AN EQUIVALENT 24-HOUR TOTAL SUSPENDED PARTICULATE (TSP) LEVEL IS 12.5 UG/M3 USING THE AIRBORNE PARTICLE DISTRIBUTION ASSUMED FOR ESTIMATION OF THE TSP EMISSIONS. THE REGION POTENTIALLY EXCEEDING THE 24-HOUR SIL EXTENDED APPROXIMATELY 3.5 KM NORTH OF SITE 3.

IN GENERAL, PREDICTIONS FOR THE MITIGATED CASE IN WHICH DUST SUPPRESSANTS WERE ASSUMED TO BE USED EXHIBITED THE SAME SPATIAL PATTERNS BUT WERE APPROXIMATELY 21 PERCENT LOWER THAN THOSE ASSUMING NO FURTHER APPLICATION OF DUST SUPPRESSANT ON-SITE. THE 24-HOUR SIL'S WERE ONLY EXCEEDED AT THE SITE BOUNDARIES.

SURFACE WATER DRAINAGE FROM THE SITE

AN ANALYSIS WAS PERFORMED TO PREDICT SHEET AND RILL EROSION WHICH MIGHT RESULT FROM A SINGLE STORM EVENT. THE OBJECTIVE WAS TO ESTIMATE THE MAXIMUM VOLUME OF WASTE CKD WHICH MIGHT MIGRATE OFF-SITE DUE TO A PEAK PRECIPITATION STORM EVENT.

SIMPLIFICATION OF THE SITE TOPOGRAPHY FOR THE MODEL ASSUMED THAT ALL WASTE CKD MOBILIZED BY SHEET AND RILL EROSION WOULD DISCHARGE OFF-SITE. ACTUAL RUNOFF AND EROSION, HOWEVER, WOULD BE INTERCEPTED AND RETAINED BY LOCAL SURFACE TOPOGRAPHY AT EACH SITE SO THAT A LARGE PORTION OF THE SEDIMENT YIELD WOULD NOT REACH THE CITY DRAIN OR NORTH BOUNDARY DITCH. SITE 2 AND SITE 3 WERE PREDICTED TO YIELD 1 AND 13 TONS OF MATERIAL, RESPECTIVELY, DUE TO A 100 YEAR 24-HOUR STORM, WHILE THE WEST SITE WAS PREDICTED TO YIELD 1.4 TONS OF SURFACE MATERIALS (WASTE CKD AND SOIL) DURING THE SAME EVENT.

MIGRATION TO GROUND WATER

SOIL-WASTE INTERACTION TESTS WERE PERFORMED ON THREE TYPES OF SOILS, (SILTY SAND, CLAY, SANDY SILTY CLAY), FOUND IN THE SHALLOW AQUIFER TO EVALUATE THE ABILITY OF THESE SOILS TO ATTENUATE CONSTITUENTS FOUND IN THE GROUND WATER THROUGH BUFFERING PH AND SORPTION OF METALS. RESULTS OF THE SOIL ATTENUATION TESTS, INDICATE THAT DISSOLVED SOLIDS, PH, AND ARSENIC CONCENTRATIONS ARE ONLY SLIGHTLY ATTENUATED BY THE SILTY SAND AND CLAY SOILS. THE SANDY SILTY CLAY, HOWEVER, SHOWED GOOD ATTENUATION OF ARSENIC AND PH. CHROMIUM AND MOLYBDENUM WERE NOT ATTENUATED BY SOILS WITHIN THE CONSTRAINTS OF THESE TESTS.

6. SUMMARY OF SITE RISKS

THIS CHAPTER PRESENT A SUMMARY OF THE HUMAN HEALTH AND ENVIRONMENTAL RISKS PRESENTED BY THE SITE. THE QUANTIFIED AND QUALIFIED RISKS, AND BACKGROUND INFORMATION ARE PRESENTED IN GREATER DETAIL IN THE RI/FS AND APPENDIX A TO THIS ROD.

RISKS TO HUMAN HEALTH

RISK ASSESSMENT OBJECTIVES

RISK ASSESSMENT ACTIVITIES RELATED TO THE SITE WERE DESIGNED TO ESTIMATE POTENTIAL RISKS TO HUMAN HEALTH UNDER THE "NO ACTION" ALTERNATIVE. IN ACCORDANCE WITH EPA GUIDANCE, RISK ASSESSMENT ACTIVITIES WERE DIVIDED INTO FOUR PARTS. FIRST, CHEMICALS OF POTENTIAL CONCERN WERE IDENTIFIED ON AND NEAR THE SITE. SECOND, TOXICITY OF THESE CHEMICALS WAS EVALUATED AND CRITICAL TOXICITY VALUES IDENTIFIED. CRITICAL TOXICITY VALUES INCLUDE REFERENCE DOSES AND SLOPE FACTORS USED TO RELATE DAILY INTAKE TO POTENTIAL ADVERSE EFFECTS. THIRD, POTENTIAL HUMAN EXPOSURE TO CHEMICALS OF CONCERN WAS QUANTITATED USING DATA OBTAINED FROM SITE CHARACTERIZATION ACTIVITIES. FINALLY, RISK WAS CHARACTERIZED BY COMPARING POTENTIAL HUMAN EXPOSURES WITH CRITICAL TOXICITY VALUES. CARCINOGENIC RISK WAS EVALUATED SEPARATELY FROM RISK OF NON-CARCINOGENIC EFFECTS, SINCE CURRENT KNOWLEDGE SUGGESTS THAT CANCER INDUCTION MAY OCCUR VIA NON-THRESHOLD MECHANISMS.

HAZARD IDENTIFICATION

SEVERAL CHEMICALS OF POTENTIAL CONCERN FOR HUMAN HEALTH WERE IDENTIFIED IN GROUND WATER, SURFACE WATER AND WASTE CKD AT THE SITE. THESE INCLUDE ARSENIC, CADMIUM, CHROMIUM, LEAD, AND MOLYBDENUM. IN ADDITION, THE CAUSTIC NATURE (HIGH PH) OF THE WASTE CKD WAS IDENTIFIED AS A POTENTIAL THREAT.

TOXICITY ASSESSMENT

INHALATION ROUTE

THREE CHEMICALS OF CONCERN WERE IDENTIFIED AS POTENTIAL HUMAN CARCINOGENS FOLLOWING EXPOSURE VIA INHALATION. BOTH ARSENIC AND CHROMIUM(VI) ARE CLASS A (KNOWN HUMAN) CARCINOGENS, WHILE CADMIUM IS A CLASS B1 (PROBABLE HUMAN) CARCINOGEN. FOR THESE THREE CHEMICALS, EXCESSIVE INHALATION EXPOSURE COULD RESULT IN AN INCREASE IN LUNG, AND POSSIBLY OTHER TYPES, OF CANCER. CRITICAL TOXICITY VALUES (SLOPE FACTORS) ARE AVAILABLE FOR ALL THREE CHEMICALS. THESE SLOPE FACTORS PROVIDE A MEANS OF RELATING DAILY DOSE TO CANCER INCIDENCE. IN ADDITION TO THE HEAVY METALS PRESENT, THE FINE PARTICULATE NATURE OF THE WASTE CKD MAY ALLOW IT TO BE EASILY ENTRAINED AND TRANSPORTED OFF-SITE, CAUSING RESPIRATORY IRRITATION.

INGESTION ROUTE

ARSENIC IS ALSO A CLASS A CARCINOGEN WHEN INGESTED. EXCESSIVE EXPOSURE VIA INGESTION COULD RESULT IN AN INCREASED INCIDENCE OF SKIN CANCER, AND PERHAPS OF SOME INTERNAL CANCERS. A SLOPE FACTOR IS AVAILABLE FOR INGESTED ARSENIC.

ALL OF THE CHEMICALS OF CONCERN MAY PRODUCE ADVERSE NON-CARCINOGENIC EFFECTS EITHER BY INHALATION OR INGESTION. HOWEVER, CRITICAL TOXICITY VALUES (REFERENCE DOSES) ARE GENERALLY AVAILABLE ONLY FOR THE INGESTION PATHWAY. THUS, QUANTITATIVE ASSESSMENT OF NON-CARCINOGENIC RISK WAS DONE ONLY FOR THE INGESTION PATHWAY. (REFERENCE DOSES ARE AN ESTIMATE OF A DAILY INTAKE OF A CHEMICAL WHICH WILL NOT RESULT IN ADVERSE EFFECTS EVEN OVER A LIFETIME OF EXPOSURE.)

DERMAL ROUTE

THE CAUSTIC PROPERTIES OF THE WASTE CKD MAY CAUSE ADVERSE EFFECTS

FOLLOWING DIRECT CONTACT WITH SKIN, EYES OR MUCOUS MEMBRANES. EXCESSIVE ACUTE EXPOSURE COULD LEAD TO BURNS OF THE EXPOSED TISSUES. SUBCHRONIC OR CHRONIC EXPOSURE COULD LEAD TO DERMATITIS OR CHRONIC ECZEMATOUS SKIN CONDITIONS. THERE CURRENTLY ARE NO CRITICAL TOXICITY VALUES AVAILABLE TO USE IN QUANTIFYING THESE RISKS.

NONE OF THE CHEMICALS OF CONCERN (ARSENIC, CADMIUM, CHROMIUM, LEAD AND MOLYBDENUM) ARE EXPECTED TO CAUSE ADVERSE SYSTEMIC EFFECTS FOLLOWING DERMAL EXPOSURE. IN GENERAL, THE SKIN IS AN EFFECTIVE BARRIER TO ABSORPTION OF METALS AND PREVENTS TOXIC QUANTITIES OF THESE AGENTS FROM ENTERING THE BODY FOLLOWING THE TYPES OF EXPOSURE EXPECTED AT HAZARDOUS WASTE SITES.

EXPOSURE ASSESSMENT

IN ORDER FOR HUMAN EXPOSURE TO OCCUR, THERE MUST BE, 1) A SOURCE OF CONTAMINANT, 2) A MEANS FOR THIS CONTAMINANT TO MOVE INTO ENVIRONMENTAL MEDIA (AIR, WATER, SOIL, VEGETABLES, ETC.), 3) A POINT OF EXPOSURE WHERE HUMANS CAN COME INTO CONTACT WITH THE CONTAMINANT AND, 4) A ROUTE OF EXPOSURE (INHALATION, INGESTION, DERMAL CONTACT) THROUGH WHICH THE CONTAMINANT CAN ENTER THE BODY. THESE FOUR ELEMENTS DESCRIBE AN EXPOSURE PATHWAY AND, WHENEVER ALL FOUR ELEMENTS ARE PRESENT, OR CAN REASONABLY BE ASSUMED TO BE PRESENT IN THE FUTURE, THE PATHWAY IS COMPLETE AND EXPOSURE WILL OCCUR. FOR THE PORTLAND CEMENT CO. SUPERFUND SITE, SEVERAL COMPLETE OR POTENTIALLY COMPLETE EXPOSURE PATHWAYS WERE IDENTIFIED AND EVALUATED.

- * INCIDENTAL INGESTION OF WASTE CKD BY SITE TRESPASSERS.
- * INCIDENTAL INGESTION OF WASTE CKD BY WORKERS (CURRENT AND FUTURE).
- * DIRECT DERMAL CONTACT WITH WASTE CKD BY WORKERS AND TRESPASSERS
- * INHALATION OF FUGITIVE DUST FROM WASTE CKD BY WORKERS OR NEARBY RESIDENTS.
- * INGESTION OF VEGETABLES CONTAMINATED BY AIRBORNE WASTE CKD.
- * INGESTION OF FISH, MEAT AND DAIRY PRODUCTS FROM ANIMALS WHICH FEED UPON PLANT MATERIAL CONTAMINATED BY AIRBORNE WASTE CKD.

TO ESTIMATE THE AMOUNT OF EACH CHEMICAL TAKEN INTO THE BODY, STANDARD EPA EXPOSURE PARAMETERS AND EQUATIONS WERE USED (SEE APPENDIX TABLE A-2). CONCENTRATIONS OF CHEMICALS OF CONCERN IN SOIL AND WATER WERE TAKEN DIRECTLY FROM ANALYSES OF SAMPLES COLLECTED AT THE SITE. CONCENTRATIONS OF CHEMICALS IN AIR AND AMOUNTS DEPOSITED ON PLANTS AND VEGETABLES WERE ESTIMATED BY MODELING (APPENDIX PP. 10-13). THE RESULTS OF THE EXPOSURE ASSESSMENT ARE PROVIDED AS CHRONIC DAILY INTAKES IN APPENDIX A, TABLE A4 AND A5 AND ARE EXPRESSED AS MG OF CHEMICAL INTAKE PER KILOGRAM BODY WEIGHT PER DAY.

ALTHOUGH GROUND WATER DIRECTLY UNDER THE SITE IS AFFECTED BY THE WASTE CKD (PH LEVELS AS HIGH AS 12.2 HAVE BEEN DETECTED) THIS EXPOSURE PATHWAY WILL BE ADDRESSED IN SUBSEQUENT DECISION DOCUMENTS. THE REMOVAL OF THE WASTE CKD WILL FACILITATE EASIER EVALUATION OF THESE RISK.

RISK CHARACTERIZATION

IN ACCORDANCE WITH EPA GUIDANCE, CARCINOGENIC RISKS WERE ESTIMATED BY MULTIPLYING THE SLOPE FACTOR FOR THE CHEMICAL BY THE CHRONIC DAILY INTAKE. THE RESULTING NUMBER IS AN ESTIMATE OF THE PROBABILITY OF GETTING CANCER AS A RESULT OF EXPOSURE TO THE CHEMICAL. CARCINOGENIC RISKS FOR THE VARIOUS EXPOSURE PATHWAYS ARE SUMMARIZED IN APPENDIX A, TABLE A7 AND A9.

NON-CARCINOGENIC RISKS WERE EVALUATED BY TAKING THE RATIO OF THE CHRONIC

DAILY INTAKE AND THE REFERENCE DOSE FOR THE CHEMICAL. SINCE THE REFERENCE DOSE IS THOUGHT TO REPRESENT AN EXPOSURE WHICH CAN BE BORNE FOR A LIFETIME WITHOUT ADVERSE EFFECT, A RATIO LESS THAN ONE SUGGESTS THAT NO ADVERSE EFFECTS ARE LIKELY (I.E. THE CHRONIC DAILY INTAKE IS LESS THAN THE REFERENCE DOSE). A RATIO GREATER THAN ONE SUGGESTS THE POTENTIAL FOR ADVERSE EFFECTS. RISKS FOR NON-CARCINOGENIC EFFECTS ARE SUMMARIZED IN APPENDIX A, TABLES A8, AND A10 - A12.

AIR MODELING INDICATED THAT EPA'S 24-HOUR SIGNIFICANT IMPACT LEVELS FOR AIR EXPOSURE TO PARTICULATES WAS EXCEEDED IN AN AREA EXTENDING APPROXIMATELY 3.5 KILOMETERS NORTH OF THE SITE UNDER THE "NO ACTION" SCENARIO. WASTE CKD PARTICLES WHICH DEPOSIT IN THE LUNGS WOULD ALSO FORM AN IRRITATING HIGH PH SOLUTION WHICH COULD CAUSE, IN CASE OF HIGH EXPOSURE, BURNS IN THE TISSUES LINING THE RESPIRATORY TRACT. SUCH EXPOSURES COULD ALSO EXACERBATE CHRONIC LUNG DISEASES SUCH AS EMPHYSEMA, ASTHMA, AND CHRONIC BRONCHITIS.

A MAJOR PORTION OF THE RISKS ON AND NEAR THE SITE IS THE ACUTE RISK ASSOCIATED WITH THE CAUSTIC CHARACTERISTIC OF THE MATERIAL. CAUSTIC AGENTS CAUSE A RANGE OF EFFECTS FROM MILD IRRITATION TO SEVERE BURNS IN BIOLOGIC TISSUE DEPENDING ON A NUMBER OF FACTORS, INCLUDING LENGTH OF CONTACT, PH, TYPE OF TISSUE, INDIVIDUAL SENSITIVITY, ETC. NO GUIDANCE EXISTS WITHIN THE EPA RISK ASSESSMENT COMMUNITY WHICH WOULD ALLOW QUANTITATION OF THIS TYPE OF HEALTH EFFECT.

HOWEVER, THE RISKS DUE TO CAUSTIC PROPERTIES OF WASTE CKD ARE SIGNIFICANT. CONTACT OF WASTE CKD WITH MUCOUS MEMBRANES WOULD PRODUCE A SOLUTION WITH A PH AS HIGH AS 12 OR 13. SIMILAR HIGH PH SOLUTIONS COULD BE PRODUCED ON THE SKIN WHEN WASTE CKD PARTICLES ENCOUNTER SWEAT. SUCH SOLUTIONS WOULD BE, AT BEST, EXTREMELY IRRITATING TO EYES AND OTHER MOIST TISSUES. MORE SEVERE EFFECTS SUCH AS BURNS OR SCARRING CANNOT BE RULED OUT. CHILDREN PLAYING ON WASTE CKD, AS WELL AS WORKERS ON SITE, WOULD BE AT RISK FOR THESE ACUTE EFFECTS. THERE IS ALSO THE POTENTIAL FOR CHRONIC SKIN CONDITIONS RESULTING FROM FREQUENT DERMAL EXPOSURE.

UNCERTAINTIES

AS IN ALL RISK ASSESSMENTS, THERE ARE UNCERTAINTIES IN THE RISK ESTIMATES. FOUR AREAS OF UNCERTAINTY ARE PARTICULARLY IMPORTANT IN EVALUATING THE RISK AT THE PORTLAND CEMENT CO. SUPERFUND SITE.

FIRST, THE ASSESSMENT WAS NOT ABLE TO QUANTIFY RISK OF BURNS DUE TO DIRECT DERMAL CONTACT WITH WASTE CKD. SINCE THERE WAS A REPORT OF SKIN RASHES AS A RESULT OF EXPOSURE ON-SITE, THE RISK APPEARS TO BE SIGNIFICANT. THIS RISK IS NOT REFLECTED IN THE RISK TABLES.

SECONDLY, THERE ARE APPROXIMATELY 360 TONS OF CHROMIUM BRICKS ON SITE WHICH WERE NOT EVALUATED IN THE ASSESSMENT. THUS, EXPOSURE TO CHROMIUM, ESPECIALLY POTENTIAL FUTURE EXPOSURE, MAY BE GREATLY UNDERESTIMATED.

THIRD, NO RESIDENTIAL SCENARIO WAS USED IN ASSESSING RISK AT THE SITE. IF THE ASSUMPTION THAT RESIDENTIAL DEVELOPMENT WILL NEVER OCCUR ON SITE IS INCORRECT, RISKS MAY BE SUBSTANTIALLY UNDERESTIMATED.

FINALLY, EXPOSURE VIA THE AIR PATHWAY WAS BASED ON AN EMPIRICAL MODEL, RATHER THAN ON ACTUAL DATA. DEPENDING UPON SPECIFIC CONDITIONS AT THE SITE, THERE MAY BE CONSIDERABLE OVER OR UNDERESTIMATION OF RISK DUE TO RELIANCE ON SUCH MODELING DATA.

ENVIRONMENTAL RISKS

ENVIRONMENTAL RISKS ARE OFTEN DIFFICULT TO QUANTIFY AND NO ATTEMPT WAS MADE AT SUCH QUANTITATION IN THE RISK ASSESSMENT. HOWEVER, SEVERAL ISSUES WERE ADDRESSED QUALITATIVELY AND ARE SUMMARIZED BELOW.

FIRST, THE WASTE CKD HAS ALTERED THE VEGETATION SEVERELY ON-SITE AND THE TRANSPORT OF WASTE CKD OFF-SITE HAS THE POTENTIAL TO ADVERSELY IMPACT

VEGETATION IN NEIGHBORING AREAS. MOST OF THE IMPACT ON VEGETATION MAY BE DUE TO THE HIGH PH.

SECONDLY, PONDED WATER ON THE WASTE CKD MAY CAUSE BURNS TO TERRESTRIAL WILDLIFE, INCLUDING NUMEROUS AVIAN SPECIES WHICH MIGHT USE NEARBY SURPLUS CANAL AS A NESTING AND FEEDING AREA.

THIRDLY, THE MOLYBDENUM PRESENT IN THE WASTE CKD HAS THE POTENTIAL FOR CAUSING ADVERSE EFFECTS TO ANY LIVESTOCK WHICH MAY BE IN THE IMMEDIATE AREA.

FINALLY, FISH IN THE JORDAN RIVER AND SURPLUS CANAL COULD BE ADVERSELY EFFECTED BY CAUSTIC RUN-OFF FROM THE WASTE CKD. SUCH EFFECTS WERE NOT EVIDENT DURING SITE CHARACTERIZATION WORK.

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7. DESCRIPTION OF ALTERNATIVES

INTRODUCTION

THE PURPOSE OF THIS SECTION IS TO DESCRIBE ALTERNATIVES THAT ARE TECHNICALLY IMPLEMENTABLE AT THE SITE. THE NUMBERING SYSTEM FOR THE ALTERNATIVES IS THE ONE USED IN THE FEASIBILITY STUDY. ALTERNATIVES THAT DID NOT PASS INITIAL SCREENING ON THE BASIS OF EFFECTIVENESS, IMPLEMENTABILITY, AND COST ARE NOT DESCRIBED IN THIS ROD. DURING THE PROCESS OF THE DEVELOPMENT OF ALTERNATIVES, EIGHT SEPARATE OPTIONS APPLICABLE TO SITES 2 AND 3 AND THE WEST SITE, AND 2 OPTIONS APPLICABLE ONLY TO THE WEST SITE WERE RETAINED FOR DETAILED ANALYSIS. THE STATE OF UTAH HAS DECIDED TO CONSIDER THE WASTE CKD AS ONE OPERABLE UNIT, AND HAS THEREFORE CONDENSED THE LIST OF ALTERNATIVES CORRESPONDINGLY. EIGHT OF THE ALTERNATIVES IDENTIFIED FOR THE WEST SITE WERE CONCEPTUALLY EQUIVALENT TO THE EIGHT ALTERNATIVES FOR SITES 2 AND 3. HOWEVER, ALTERNATIVES 3 AND 4 APPLIED ONLY TO THE WEST SITE, AND CONSEQUENTLY DO NOT SATISFY THE THRESHOLD CRITERION FOR SELECTION OF A REMEDY. THEREFORE, ALTERNATIVES 3 AND 4 ARE NOT EVALUATED IN THIS ROD.

SINCE THE REVISED PROPOSED PLAN WAS ISSUED, THE RCRA RULE, "LAND DISPOSAL RESTRICTIONS FOR THE THIRD SCHEDULED WASTES" WAS PROMULGATED. LAND DISPOSAL OF CHROMIUM HAZARDOUS WASTE ABOVE THE SPECIFIED TREATMENT LEVEL IS PROHIBITED. THUS, THIS RULE REQUIRES THE TREATMENT OF THE CHROMIUM BRICKS PRIOR TO LAND DISPOSAL. EXCEPT FOR THE "NO ACTION" ALTERNATIVE, THE ALTERNATIVES DESCRIBED IN THE REVISED PROPOSED PLAN REQUIRED THE SEPARATION AND DISPOSAL OF THE BRICKS AT A RCRA SUBTITLE C FACILITY. HOWEVER, DUE TO THE ADDITION OF TREATMENT, THE BRICKS WILL BE SEPARATED AND TEMPORARILY STORED AT AN ACCEPTABLE LOCATION UNDER THIS OPERABLE UNIT. TREATMENT AND DISPOSAL OF THE CHROMIUM BRICKS WILL BE ADDRESSED IN THE NEXT OPERABLE UNIT.

THE NARRATIVES INCLUDED IN THE CHAPTER HAVE BEEN CHANGED TO REFLECT THE OPERABLE UNIT APPROACH FOR THE CHROMIUM BRICK TREATMENT AND DISPOSAL. THE SPECIFIC COST LISTED IN EACH ALTERNATIVE WERE NOT CHANGED. THE COST FOR THE TRANSPORTATION AND DISPOSAL OF THE BRICKS IDENTIFIED IN THE RI/FS IS APPROXIMATELY \$60,800. THE ACTUAL REDUCTION IN THE COST FOR EACH ALTERNATIVE (EXCEPT THE "NO ACTION" ALTERNATIVE) UNDER THIS OPERABLE UNIT WILL BE SOME WHAT LESS THAN THIS AMOUNT DUE TO THE COST OF ON-SITE CHROMIUM BRICK STORAGE.

ADDITIONALLY, ALL ALTERNATIVES REQUIRE THE MONITORING OF GROUND WATER AT THE SITE. GROUND WATER MONITORING IS NECESSARY TO CHARACTERIZE THE EXTENT OF THE GROUND WATER CONTAMINATION.

ARARS

FOR ALL RESPONSE ACTIONS, THE APPLICABLE, RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) OF PRIMARY IMPORTANCE ARE THOSE RELATING TO 1) STATE SOLID WASTE DISPOSAL REGULATIONS (UTAH TITLE 26, CHAPTER 14), IF APPLICABLE; 2) STATE HAZARDOUS WASTE STORAGE AND DISPOSAL REGULATIONS

PERTAINING TO RCRA SUBTITLE C FACILITIES FOR THE STORAGE AND DISPOSAL OF CHROMIUM-BEARING REFRACTORY KILN BRICK; 3) FEDERAL (40 CFR PART 268) RCRA REGULATIONS PERTAINING TO LAND DISPOSAL RESTRICTIONS; AND 4) FEDERAL (40 CFR PART 50) AND STATE (UTAH TITLE 26, CHAPTER 13) AIR REGULATIONS ON TOTAL SUSPENDED PARTICULATES (TSP) AND FUGITIVE DUST CONTROL. TABLE 7-1 SUMMARIZES ALL THE ARARS IDENTIFIED FOR THE SITE.

NO ACTION ALTERNATIVE

ALTERNATIVE 1 (CKD/1) - NO ACTION

DESCRIPTION

UNDER THE "NO ACTION" ALTERNATIVE THE WASTE CKD WOULD REMAIN ON THE SITE AS IT IS NOW. THE RESULTS OF THE BASELINE RISK ASSESSMENT APPLY TO THE "NO ACTION" ALTERNATIVE. THE "NO ACTION" ALTERNATIVE DOES NOT RESULT IN ANY REDUCTION OF SITE RISKS. THE CHROMIUM-BEARING REFRACTORY KILN BRICK (WHICH ARE A HAZARDOUS WASTE) REMAIN ON THE SITE. IF THE CURRENT APPLICATION OF THE DUST SUPPRESSANT WERE HALTED, FUGITIVE DUST EMISSIONS WOULD INCREASE OVER TIME FROM CURRENT LEVELS TO THE LEVEL THAT EXISTED BEFORE DUST SUPPRESSANT WAS USED.

NO ENVIRONMENTAL MONITORING IS PROPOSED IN CONJUNCTION WITH THIS ALTERNATIVE AND NO COSTS ARE ASSOCIATED WITH THIS ALTERNATIVE.

INSTITUTIONAL CONTROLS COULD BE IMPLEMENTED AS A LIMITED ACTION SUPPLEMENT TO THE "NO ACTION" ALTERNATIVE. DEED RESTRICTIONS THAT WOULD BE IMPOSED TO LIMIT FUTURE SITE DEVELOPMENT ARE LIKELY TO PREVENT DISTURBANCE OF THE WASTE CKD AND AN INCREASE IN FUGITIVE DUST. WELL RESTRICTIONS ARE LIKELY TO PREVENT THE CONSTRUCTION AND USE OF NEAR-SURFACE WELLS ON AND ADJACENT TO THE SITE. THE RANGE OF FUTURE SITE USES UNDER THIS ALTERNATIVE WOULD BE LIMITED BY THE NEED TO PROVIDE PROTECTION AGAINST PUBLIC HEALTH THREATS AT THE SITE.

COMPLIANCE WITH ARARS

THE "NO ACTION" ALTERNATIVE WOULD NOT MEET THE ARARS IDENTIFIED IN THIS ROD CHAPTER.

CONTAINMENT ALTERNATIVES

ALTERNATIVE 5 (CKD/5) - CONSOLIDATION OF WASTE CKD ON THE WEST SITE

DESCRIPTION

ALL IDENTIFIABLE WASTE CKD WOULD BE EXCAVATED FROM THE WEST SITE AND TEMPORARILY STORED ON SITE 2. EXCAVATED AREAS WITHIN THE WEST SITE WOULD BE BACKFILLED USING BANKRUN FILL. ROUGH SITE GRADING WOULD BE PERFORMED OVER THE APPROXIMATELY 24 ACRES AFFECTED AT THE WEST SITE.

WEST SITE WASTE CKD TEMPORARILY STORED AT SITE 2, AND WASTE CKD AND CODISPOSED NONHAZARDOUS MATERIALS LOCATED ON SITES 2 AND 3, WOULD BE EXCAVATED USING A LOADER OR DRAGLINE AND TRANSPORTED BY TRUCK OR SCRAPER TO THE WEST SITE. THESE MATERIALS WOULD BE PLACED ON TOP OF THE BACKFILLED AND GRADED WEST SITE AREA, COMPACTED AND CAPPED WITH A LAYERED SYSTEM AND REVEGETATED. LONE STAR INDUSTRIES REPORTED THAT THE WEST SITE WAS SELECTED FOR CONSOLIDATION OF WASTE CKD BECAUSE IT HAS A SLIGHTLY HIGHER ELEVATION THAN SITES 2 AND 3.

AFTER ADDRESSING ANY CONTAMINATION OF RESIDUAL SOILS, EXCAVATED AREAS WITHIN SITES 2 AND 3 WOULD BE RESTORED TO PRE-FILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIALS. CHROME BRICKS WOULD BE SEPARATED DURING EXCAVATION, AND TEMPORARILY STORED. ESTIMATED MATERIAL QUANTITIES REQUIRED FOR THIS ALTERNATIVE ARE PRESENTED IN TABLE 7-2.

MATERIALS HANDLING REQUIREMENTS AND ENGINEERING CONTROLS

WASTE CKD EXCAVATION AT SITE 3 AND THE WEST SITE WOULD BE PERFORMED USING CONVENTIONAL EARTHWORK EQUIPMENT. EXCAVATED WASTE CKD WOULD BE LOADED INTO TRUCKS OR SCRAPERS FOR TRANSPORTATION TO AND PLACEMENT AT THE WEST SITE. INCLEMENT WEATHER COULD REQUIRE THE CONSTRUCTION OF HAUL ROADS USING A GEOFABRIC FOR SUPPORT. EXCAVATION OF THE WASTE CKD AT SITE 2 COULD REQUIRE RIPPING PRIOR TO EXCAVATION BECAUSE OF THE CEMENTED NATURE OF THE MATERIAL. CONVENTIONAL DUST CONTROL METHODS WOULD BE EMPLOYED TO MINIMIZE FUGITIVE EMISSIONS. SEVEN ACTIVITIES THAT COULD GENERATE FUGITIVE EMISSIONS WOULD BE 1) EXCAVATION OF WASTE CKD AND CODISPOSED NONHAZARDOUS MATERIALS FROM THE SITE; 2) LOADING AND HAULING OF WASTES FROM THE WEST SITE TO AND FROM THE TEMPORARY STORAGE AREA ON SITE 2; 3) THE EXCAVATION IN THE BANKRUN BORROW STOCKPILE; 4) THE APPLICATION AND MIXING OF BENTONITE TO CONSTRUCT THE LOW PERMEABILITY LAYER; 5) LOADING AND HAULING OF SITE 2 AND 3 WASTE CKD TO THE WEST SITE; 6) THE PLACEMENT AND SPREADING OF SITE RESTORATION FILL AT SITES 2 AND 3; AND 7) CONSOLIDATION OF ALL WASTE CKD ONTO THE WEST SITE. DUST SUPPRESSANTS WOULD BE USED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. THE RELATIVELY HIGH IN SITU MOISTURE CONTENT OF THE WASTE CKD WOULD TEND TO MINIMIZE EMISSIONS DURING EXCAVATION AND PLACEMENT. CONSTRUCTION OF THE LAYERED CAP SYSTEM WOULD USE CONVENTIONAL EARTHMOVING EQUIPMENT. FENCING AND OTHER CONTROLS WOULD BE EMPLOYED TO PREVENT THE PUBLIC FROM ENTERING THE SITE DURING REMEDIATION.

OPERATION AND MAINTENANCE REQUIREMENTS

THE CLOSURE COVER WOULD BE INSPECTED ANNUALLY. ROUTINE MAINTENANCE INCLUDING WEED CONTROL OR PARTIAL REVEGETATION WOULD BE PERFORMED AS REQUIRED.

OFF-SITE DISPOSAL

NONHAZARDOUS MATERIALS SCREENED FROM THE WASTE CKD WOULD BE TRANSPORTED AND DISPOSED AT A LANDFILL PERMITTED TO RECEIVE SUCH MATERIALS.

EMISSIONS CONTROL

DUST SUPPRESSANTS WOULD BE USED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. TRUCKS WOULD BE COVERED WITH TARPS DURING TRANSPORT OF WASTE MATERIALS TO THE LANDFILL SITE.

INSTITUTIONAL CONTROLS REQUIRED

DEED RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT FUTURE SITE DEVELOPMENT THAT COULD EITHER DAMAGE OR DISTURB THE CLOSURE COVER. RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

SITE-SPECIFIC CONSIDERATIONS

THE MAJOR MATERIAL MOVEMENT ACTIVITIES WOULD BE THE EXCAVATION, SCREENING, AND DOUBLE-HANDLING OF 109,000 CUBIC YARDS OF WASTE CKD FROM THE WEST SITE, BACKFILLING OF THE RESULTING EXCAVATION, AND EXCAVATION OF BOTH STOCKPILED WEST SITE WASTE CKD AND THE 387,000 CUBIC YARDS OF WASTE CKD FROM SITES 2 AND 3 AND TRANSPORT AND PLACEMENT AT THE WEST SITE. DIFFERENT EXCAVATION METHODS WOULD PROBABLY BE USED AT SITE 2 AND SITE 3 BECAUSE OF THE DIFFERENT FORMS IN WHICH THE WASTE CKD WAS DEPOSITED (I.E. DRY AT SITE 3 AND SLURRIED AT SITE 2).

WHILE CONSTRUCTION OF THE LANDFILL CELL WOULD LIMIT FUTURE DEVELOPMENT AT THE WEST SITE TO THAT WHICH WOULD NOT DAMAGE THE CAP, COMPLETE REMOVAL OF THE WASTE CKD FROM SITES 2 AND 3 AND THE PLACEMENT OF SITE RESTORATION FILL WOULD RETURN THESE PORTIONS OF THE SITE TO A CONDITION ALLOWING "UNRESTRICTED" FUTURE DEVELOPMENT.

COST AND IMPLEMENTATION TIME

SINCE ISSUING THE INITIAL PROPOSED PLAN IT WAS DISCOVERED THAT THE

ESTIMATED COSTS FOR ALTERNATIVE 5 PRESENTED IN THE FEASIBILITY STUDY WERE INCORRECT. THOSE INCORRECT COSTS WERE SUBSTANTIALLY LOWER THAN THE REVISED COSTS SHOWN BELOW.

THE CORRECTED PRESENT VALUE OF THE TOTAL COST OF THIS ALTERNATIVE IS ESTIMATED AT \$8.39 MILLION. CAPITAL COSTS ARE ESTIMATED AT \$9.14 MILLION. GIVEN ASSUMED PROCESS RATES, THIS ALTERNATIVE COULD BE CONSTRUCTED WITHIN THREE YEARS. CASH FLOW FOR CAPITAL EXPENSES HAS BEEN SPREAD OVER THE ESTIMATED TWO YEAR PERIOD FOR THE PURPOSE OF CALCULATING A PRESENT VALUE. ANNUAL OPERATION AND MAINTENANCE COSTS WERE ASSUMED TO BE \$5,000 FOR A 30 YEAR PERIOD.

COMPLIANCE WITH ARARS

THE CAPPING SYSTEM OF THIS ALTERNATIVE WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THE ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS.

STATE SOLID WASTE REGULATIONS IMPOSE CERTAIN REQUIREMENTS ON SOLID WASTE DISPOSAL OPERATIONS. SUCH REGULATIONS ARE APPLICABLE OR RELEVANT AND APPROPRIATE TO THE WASTE CKD. THE EXCAVATION AND PROPOSED BACKFILLING OF THE WEST SITE, PRIOR TO WASTE CONSOLIDATION AND LAYERED CAP CONSTRUCTION, WOULD REMOVE, BUT NOT COMPLETELY ISOLATE, ALL IDENTIFIABLE WASTE CKD FROM POTENTIAL FUTURE CONTACT WITH SITE GROUND WATER. THE PROPOSED CAP EXCEEDS CURRENT LANDFILL FINAL COVER REQUIREMENTS AS STATED IN THOSE REGULATIONS. ALTERNATIVE 5 WOULD COMPLY WITH CURRENT STATE SOLID WASTE REGULATIONS IF THE REQUIRED DISTANCE FROM THE MAXIMUM SEASONAL GROUND WATER TABLE WERE MET. THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH ALL IDENTIFIED ARARS.

ALTERNATIVE 6 (CKD/6) - EXCAVATION AND DISPOSAL ON-SITE

DESCRIPTION

ALTERNATIVE 6 DIFFERS FROM ALTERNATIVE 5 IN THE CONSTRUCTION OF A STATE APPROVED DOUBLE-LINED, NONCOMMERCIAL, INDUSTRIAL WASTE LANDFILL ON THE WEST SITE FOR CONTAINMENT OF THE CONSOLIDATED WASTE CKD. WASTE CKD AND CODISPOSED, NONHAZARDOUS MATERIALS FROM THE WEST SITE WOULD BE EXCAVATED. NONHAZARDOUS, OVERSIZED CONSTRUCTION DEBRIS WOULD BE SEPARATED FROM WASTE CKD AND OTHER UNDERSIZED MATERIALS. THE DEBRIS WOULD BE TRANSPORTED TO AN OFF-SITE LANDFILL FOR DISPOSAL. THE UNDERSIZED MATERIAL WOULD BE TEMPORARILY STOCKPILED ALONG WITH EXCAVATED WASTE CKD AT SITE 2. A DOUBLE-LINED INDUSTRIAL LANDFILL WOULD BE CONSTRUCTED ON THE WEST SITE. LONE STAR INDUSTRIES REPORTED THAT THE WEST SITE WAS SELECTED FOR CONSTRUCTION OF THE INDUSTRIAL LANDFILL FOR THE WASTE CKD BECAUSE IT HAS A SLIGHTLY HIGHER ELEVATION THAN SITES 2 AND 3. WASTE CKD AND CODISPOSED NONHAZARDOUS MATERIALS FROM SITES 2 AND 3 WOULD BE EXCAVATED, HAULED AND PLACED IN THE LANDFILL ALONG WITH THE STOCKPILED MATERIALS FROM THE WEST SITE. A LAYERED COVER SYSTEM SIMILAR TO THAT DESCRIBED FOR ALTERNATIVE 5 WOULD BE USED FOR LANDFILL CLOSURE, EXCEPT THAT A SYNTHETIC MEMBRANE WOULD BE USED IN PLACE OF THE LOW PERMEABILITY SOIL LAYER. LONE STAR INDUSTRIES REPORTED THAT THE WEST SITE WAS SELECTED FOR THE CONSTRUCTION OF THE LANDFILL BECAUSE IT HAS A SLIGHTLY HIGHER ELEVATION THAN SITES 2 AND 3.

THE LANDFILL CELL WOULD BE APPROXIMATELY 25 ACRES IN PLAN AREA AND LINED WITH A DOUBLE SYNTHETIC MEMBRANE AND LEAK DETECTION SYSTEM. A LAYERED COVER SYSTEM CONSISTING OF A SYNTHETIC MEMBRANE WOULD BE USED. THE ESTIMATED QUANTITIES OF MATERIALS INVOLVED ARE SHOWN IN TABLE 7-3.

THE CHROMIUM BRICKS WOULD BE HANDLED IN THE SAME MANNER AS DESCRIBED IN THE BEGINNING OF THIS CHAPTER.

MATERIALS HANDLING REQUIREMENTS AND ENGINEERING CONTROLS

THE SAME REQUIREMENTS AND CONTROLS SPECIFIED FOR ALTERNATIVE 5 ARE ALSO APPLICABLE TO THIS ALTERNATIVE.

AS REQUIRED, ADDITIONAL SIX-FOOT HIGH CHAIN LINK FENCE WITH A THREE STRAND BARBED WIRE CROWN WOULD BE CONSTRUCTED AT THE LANDFILL PERIMETER FOR ACCESS CONTROL. WARNING/NO TRESPASSING SIGNS WOULD BE POSTED ALONG THE ENTIRE PERIMETER.

OPERATION AND MAINTENANCE REQUIREMENTS

THE CLOSURE COVER WOULD BE INSPECTED ANNUALLY, AND A LEAK DETECTION SYSTEM FOR THE NEW LANDFILL WOULD BE REQUIRED. ROUTINE MAINTENANCE, INCLUDING WEED CONTROL OR PARTIAL REVEGETATION, WOULD BE PERFORMED AS REQUIRED.

OFF-SITE DISPOSAL

NONHAZARDOUS DEBRIS SCREENED FROM THE WEST SITE, OTHER THAN WASTE CKD, WOULD BE TRANSPORTED AND PROPERLY DISPOSED AT A PERMITTED LANDFILL.

EMISSIONS CONTROL

DUST SUPPRESSANTS WOULD BE USED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. TRUCKS WOULD BE COVERED WITH TARPS DURING TRANSPORT OF WASTE MATERIALS TO THE LANDFILL SITE.

INSTITUTIONAL CONTROLS REQUIRED

DEED RESTRICTIONS COULD BE IMPOSED TO PROHIBIT FUTURE SITE DEVELOPMENT THAT COULD EITHER DAMAGE OR DISTURB THE CLOSURE COVER. RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

SITE-SPECIFIC CONSIDERATIONS

AS DESCRIBED FOR ALTERNATIVE 5, THE MAJOR MATERIAL MOVEMENT ACTIVITIES FOR ALTERNATIVE 6 WOULD BE THE EXCAVATION, SCREENING AND DOUBLE HANDLING OF 109,000 CUBIC YARDS OF WASTE CKD FROM THE WEST SITE, THE EXCAVATION OF 387,000 CUBIC YARDS OF WASTE CKD FROM SITES 2 AND 3, AND THE TRANSPORT AND PLACEMENT OF THESE MATERIALS ON THE WEST SITE. DIFFERENT EXCAVATION METHODS WOULD BE USED AT SITE 2 AND SITE 3 TO ADDRESS THE DIFFERENT FORMS IN WHICH THE WASTE CKD WAS DEPOSITED (I.E., DRY AT SITE 3 AND SLURRIED AT SITE 2). THE WEST SITE MATERIALS WOULD BE SCREENED TO REMOVE LARGE CONSTRUCTION DEBRIS THAT COULD DAMAGE THE LINER OR COVER SYSTEM. NO SCREENING OF SITE 2 AND 3 WASTES IS PROPOSED.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 6 IS ESTIMATED TO BE \$11.4 MILLION. THE CAPITAL COST WAS ESTIMATED TO BE \$12.5 MILLION, FOR THE ESTIMATED THREE YEAR COMPLETION PERIOD. ANNUAL OPERATION AND MAINTENANCE COSTS ARE ESTIMATED TO BE \$5,000 OVER A 30 YEAR PERIOD.

COMPLIANCE WITH ARARS

THE ON-SITE INDUSTRIAL LANDFILL SYSTEM OF THIS ALTERNATIVE WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THE ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS.

THE DOUBLE LINED AND CAPPED LANDFILL WOULD ISOLATE ALL IDENTIFIABLE WASTE CKD FROM POTENTIAL FUTURE CONTACT WITH SITE GROUND WATER. THE PROPOSED CAP EXCEEDS CURRENT LANDFILL FINAL COVER REQUIREMENTS AS STATED IN THOSE REGULATIONS. THEREFORE, ALTERNATIVE 6 WOULD COMPLY WITH STATE SOLID WASTE REGULATIONS. THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH

ALL THE ARARS.

ALTERNATIVE 7A (CKD/7A) - EXCAVATION AND DISPOSAL OFF-SITE AT THE FLUX QUARRY SITE IN TOOELE COUNTY

DESCRIPTION

THIS ALTERNATIVE WAS INITIALLY DESIGNATED AS ALTERNATIVE CKD/7 IN THE FS SUBMITTED AUGUST 18, 1989 AND IN THE INITIAL PROPOSED PLAN RELEASED FOR PUBLIC COMMENT ON OCTOBER 16, 1989.

WASTE CKD AND CODISPOSED MATERIAL WOULD BE EXCAVATED AND TRANSPORTED TO AN OFF-SITE, STATE APPROVED, UNLINED, NONCOMMERCIAL, INDUSTRIAL WASTE LANDFILL. THE WASTE CKD AND COMMINGLED MATERIALS WOULD BE EXCAVATED USING A BACKHOE DRAGLINE, BULLDOZERS OR LOADERS AT SITES 2 AND 3, AND EITHER BACKHOES OR LOADERS AT THE WEST SITE. UNDER THE ASSUMPTIONS OF THE ANALYSIS, THE WASTE MATERIALS WOULD BE HAULED IN DUMP TRUCKS APPROXIMATELY 40 MILES TO THE NEW DISPOSAL SITE. WASTE MATERIALS WOULD BE END DUMPED, SPREAD, AND COMPACTED IN THE LANDFILL. THE LANDFILL MAY BE CONSTRUCTED IN ONE OF SEVERAL OLD LIMESTONE QUARRIES AT LONE STAR'S FLUX SITE (SEE FIGURE 7-1). ONE LANDFILL SITE (QUARRY #3) HAS BEEN EVALUATED IN ORDER TO COMPARE THE PERFORMANCE OF THE OFF-SITE DISPOSAL ALTERNATIVE WITH OTHER ALTERNATIVES. HOWEVER, OTHER LANDFILL SITING OPTIONS ARE EXPECTED TO BE AVAILABLE, THE FINAL CHOICE OF LANDFILL LOCATION AND DESIGN WOULD BE DETERMINED DURING THE REMEDIAL DESIGN PHASE OF THE REMEDIAL ACTION. TRUCKS WERE SELECTED FOR THIS ALTERNATIVE AND SUBSEQUENT ALTERNATIVES REQUIRING MOVEMENT OF WASTE CKD OFF-SITE. EXCAVATED AREAS AT THE PRESENT SITE WOULD BE RESTORED AT PRE-FILLED CONTOURS USING BANKRUN FILL MATERIALS.

THE PROPOSED LANDFILL SITE IS A 10 ACRE LIMESTONE QUARRY. GROUND WATER IS ESTIMATED TO BE AT LEAST 25 FEET FROM THE EXISTING PIT BOTTOM. NO SIDEWALL SEEPAGE IS EVIDENT. A LAYERED COVER COMPOSED OF 6 INCHES OF GRADING FILL, EITHER A GEOMEMBRANE OR 6-INCH BENTONITE AMENDED SOIL LAYER TO MINIMIZE INFILTRATION, AND A 24 INCH RANDOM SOIL PROTECTIVE COVER WOULD BE CONSTRUCTED ATOP THE WASTE CKD. A 6-INCH THICK LAYER OF WASTE ROCK WOULD THEN BE PLACED TO PROVIDE PERMANENT EROSION PROTECTION. THE ESTIMATED QUANTITIES OF MATERIALS INVOLVED ARE SHOWN IN TABLE 7-4.

THE CHROMIUM BRICKS WOULD BE HANDLED THE SAME MANNER AS DESCRIBED IN THE BEGINNING OF THIS CHAPTER AND ALTERNATIVE 5.

OPERATION AND MAINTENANCE REQUIREMENTS

THE CLOSURE COVER WOULD BE INSPECTED ANNUALLY, AND A LEAK DETECTION SYSTEM FOR THE NEW LANDFILL WOULD BE REQUIRED. NO ADDITIONAL ROUTINE MAINTENANCE WOULD BE REQUIRED.

MONITORING REQUIREMENTS

VISUAL INSPECTIONS AND GROUND WATER MONITORING CONSISTENT WITH PERMIT REQUIREMENTS WOULD BE PERFORMED.

OFF-SITE DISPOSAL

EXCAVATED WASTE CKD AND CODISPOSED MATERIALS WOULD BE DISPOSED OFF-SITE IN A STATE APPROVED INDUSTRIAL LANDFILL.

EMISSIONS CONTROL

DUST SUPPRESSANTS WOULD BE USED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. TRUCKS WOULD BE COVERED WITH TARPS DURING TRANSPORT OF WASTE MATERIALS TO THE LANDFILL SITE.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED. THESE RESTRICTIONS WOULD

PROHIBIT SITE DEVELOPMENT THAT COULD DISTURB WASTE CKD SUCH THAT FUGITIVE DUST EMISSIONS WOULD BE GENERATED, RESULTING IN POTENTIAL HEALTH AND ENVIRONMENTAL RISKS. RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

SITE-SPECIFIC CONSIDERATIONS

SITE 2 CONTAINS WASTE CKD THAT WAS PLACED AS A SLURRY. THIS MATERIAL HAS DEVELOPED LAYERS OF HARDENED WASTE CKD. A BULLDOZER OR TRACKED FRONT LOADER EQUIPPED WITH A "RIPPING" TOOTH MAY BE REQUIRED TO BREAK UP THE CRUSTS BEFORE THE WASTE CKD CAN BE EXCAVATED.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 7A IS ESTIMATED TO BE \$10.4 MILLION. CAPITAL COSTS WERE ESTIMATED TO BE \$15 MILLION SPREAD OVER A FIVE YEAR CONSTRUCTION PERIOD. OPERATION AND MAINTENANCE COSTS WERE ESTIMATED TO BE \$1,700 ANNUALLY FOR A PERIOD OF 30 YEARS.

COMPLIANCE WITH ARARS

REMOVAL OF WASTE CKD TO AN OFF-SITE LANDFILL WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THE ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS. STATE SOLID WASTE REGULATIONS REQUIRE DISPOSAL IN A STATE-APPROVED SITE. THIS ARAR WOULD BE MET.

THIS ALTERNATIVE WOULD REMOVE, BUT NOT COMPLETELY ISOLATE, ALL IDENTIFIABLE WASTE CKD FROM POTENTIAL FUTURE CONTACT WITH SITE GROUND WATER. THE CAP PROPOSED FOR THE OFF-SITE LANDFILL EXCEEDS CURRENT LANDFILL COVER REQUIREMENTS AS STATED IN THOSE REGULATIONS. THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH ALL IDENTIFIED ARARS.

ALTERNATIVE 7B (CKD/7B) - EXCAVATION AND DISPOSAL OFF-SITE WITHIN THE TOOELE COUNTY HAZARDOUS WASTE EXCLUSION ZONE

DESCRIPTION

ALTERNATIVE 7B DIFFERS FROM ALTERNATIVES 7A AND 7C IN THE LOCATION OF THE NEW, OFF-SITE INDUSTRIAL LANDFILL TO BE CONSTRUCTED FOR THE WASTE CKD. ALTERNATIVE 7B WAS NOT IN THE AUGUST 18, 1989 FS SUBMITTED FOR THIS SITE, BUT WAS DEVELOPED WITH ADDENDUM INFORMATION TO THE FS DATED MARCH 20, 1990 SUBMITTED BY LONE STAR INDUSTRIES.

WASTE CKD AND CODISPOSED NONHAZARDOUS MATERIALS WOULD BE EXCAVATED, LOADED INTO TRUCKS AND TRANSPORTED TO AN OFF-SITE, STATE APPROVED, DOUBLE-LINED, NONCOMMERCIAL, INDUSTRIAL WASTE LANDFILL LOCATED IN TOOELE COUNTY. THE LANDFILL WOULD BE CONSTRUCTED WITHIN THE DESIGNATED TOOELE COUNTY HAZARDOUS INDUSTRIES ZONE (MG-H) (SEE FIGURE 7-2). EXCEPT FOR CHROME BRICK, THE CODISPOSED MATERIAL WOULD BE TRANSPORTED ALONG WITH THE WASTE CKD FOR DISPOSAL IN THE LANDFILL. CHROME BRICKS WOULD BE SEPARATED DURING EXCAVATION AND TEMPORARILY STORED ON-SITE. AFTER ADDRESSING ANY RESIDUAL SOIL CONTAMINATION, EXCAVATED AREAS WOULD BE RESTORED TO PRE-FILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIAL.

THE LANDFILL WOULD BE CONSTRUCTED ON A 30 ACRE PARCEL WHICH WOULD HAVE TO BE IDENTIFIED, PURCHASED, ZONED, AND PERMITTED FOR INDUSTRIAL WASTE DISPOSAL. A SPECIFIC SITE LOCATION FOR THIS LANDFILL HAS NOT BEEN DETERMINED. THE LANDFILL CELL WOULD BE APPROXIMATELY 25 ACRES IN PLAN AREA, SURROUNDED BY A 5 ACRE BUFFER ZONE, AND LINED WITH A DOUBLE SYNTHETIC MEMBRANE AND LEAK DETECTION SYSTEM. A LAYERED COVER SYSTEM CONSISTING OF A SYNTHETIC MEMBRANE WOULD BE USED. AS REQUIRED, A SIX-FOOT HIGH CHAIN LINK FENCE WITH A THREE-STRAND BARBED WIRE CROWN

WOULD BE CONSTRUCTED AT THE LANDFILL PERIMETER FOR ACCESS CONTROL. THE ESTIMATED QUANTITIES OF MATERIALS INVOLVED ARE SHOWN IN TABLE 7-5.

MONITORING REQUIREMENTS

VISUAL INSPECTION AND GROUND WATER MONITORING CONSISTENT WITH PERMIT REQUIREMENTS WOULD BE PERFORMED. A LEAK DETECTION SYSTEM FOR THE NEW LANDFILL WOULD ALSO BE REQUIRED.

OFF-SITE DISPOSAL

EXCAVATED WASTE CKD AND COMMINGLED MATERIALS WOULD BE DISPOSED OFF-SITE IN A PERMITTED INDUSTRIAL LANDFILL.

EMISSIONS CONTROL

DUST SUPPRESSANTS WOULD BE USED DURING CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. TRUCKS WOULD BE COVERED WITH TARPS DURING TRANSPORT OF WASTE MATERIALS TO THE LANDFILL SITE.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED. THESE RESTRICTIONS WOULD PROHIBIT SITE DEVELOPMENT THAT COULD DISTURB WASTE CKD SUCH THAT FUGITIVE DUST EMISSIONS WOULD BE GENERATED, RESULTING IN POTENTIAL HEALTH AND ENVIRONMENTAL RISKS.

RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

SITE-SPECIFIC CONSIDERATIONS

THE MAJOR MATERIAL MOVEMENT ACTIVITIES WILL BE A RESULT OF THE EXCAVATION OF 380,000 CUBIC YARDS OF WASTE CKD FROM SITES 2 AND 3 AND 109,000 CUBIC YARDS OF WASTE CKD AND COMMINGLED MATERIAL FROM THE WEST SITE. SITE 2 CONTAINS WASTE CKD THAT WAS PLACED AS A SLURRY. THIS MATERIAL HAS DEVELOPED LAYERS OF HARDENED WASTE CKD. A BULLDOZER OR TRACKED FRONT LOADER EQUIPPED WITH A "RIPPING" TOOTH MAY BE REQUIRED TO BREAK UP THE CRUSTS BEFORE THE WASTE CKD CAN BE EXCAVATED.

THE COMMINGLED WEST SITE WASTE CKD WOULD REQUIRE SELECTIVE EXCAVATION AND THE SEPARATION OF LARGE CONSTRUCTION DEBRIS PRIOR TO SHIPMENT OF THE WASTE CKD OFF-SITE FOR DISPOSAL.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 7B IS ESTIMATED TO BE \$18.6 MILLION. CAPITOL COSTS WERE ESTIMATED TO BE \$25.4 MILLION SPREAD OVER A FIVE YEAR PERIOD. OPERATION AND MAINTENANCE COSTS ARE ESTIMATED TO BE \$5,000 ANNUALLY FOR A PERIOD OF 30 YEARS.

COMPLIANCE WITH ARARS

REMOVAL OF WASTE CKD TO AN OFF-SITE LANDFILL WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THIS ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS. STATE SOLID WASTE REGULATIONS REQUIRE DISPOSAL IN A STATE APPROVED SITE. THIS ARAR WOULD BE MET.

THIS ALTERNATIVE WOULD ISOLATE ALL IDENTIFIABLE WASTE CKD FROM POTENTIAL FUTURE CONTACT WITH SITE GROUNDWATER. THE CAP PROPOSED FOR THE OFF-SITE LANDFILL EXCEEDS CURRENT LANDFILL COVER REQUIREMENTS. THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH ALL IDENTIFIED ARARS.

ALTERNATIVE 7C (CKD/7C) - EXCAVATION AND DISPOSAL OFF-SITE IN THE

VICINITY OF THE SALT LAKE VALLEY LANDFILL

DESCRIPTION

ALTERNATIVE 7C DIFFERS FROM ALTERNATIVES 7A AND 7B IN THE LOCATION OF THE NEW OFF-SITE INDUSTRIAL LANDFILL TO BE CONSTRUCTED FOR THE WASTE CKD. ALTERNATIVE 7C WAS NOT IN THE AUGUST 18, 1989 FS SUBMITTED FOR THIS SITE, BUT WAS DEVELOPED WITH ADDENDUM INFORMATION TO THE FS DATED MARCH 20, 1990 SUBMITTED BY LONE STAR INDUSTRIES. THE ADDENDUM FS INFORMATION HAS BEEN PLACED IN THE ADMINISTRATIVE RECORD FOR THIS SITE.

WASTE CKD AND CODISPOSED NONHAZARDOUS MATERIALS WOULD BE EXCAVATED, LOADED INTO TRUCKS AND TRANSPORTED TO AN OFF-SITE, STATE APPROVED, DOUBLE-LINED, NONCOMMERCIAL, INDUSTRIAL WASTE LANDFILL LOCATED IN THE GENERAL VICINITY OF THE SALT LAKE VALLEY LANDFILL (SEE FIGURE 7-3). EXCEPT FOR CHROME BRICK, THE CODISPOSED MATERIAL WOULD BE TRANSPORTED ALONG WITH THE WASTE CKD FOR DISPOSAL IN THE LANDFILL. CHROME BRICKS SEPARATED AND WOULD BE TEMPORARILY STORED ON-SITE. AFTER ADDRESSING ANY RESIDUAL SOIL CONTAMINATION, EXCAVATED AREAS WOULD BE RESTORED TO PRE-FILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIAL.

THE LANDFILL WOULD BE CONSTRUCTED ON A 30 ACRE PARCEL WHICH WOULD HAVE TO BE IDENTIFIED, PURCHASED, ZONED, AND PERMITTED FOR INDUSTRIAL WASTE DISPOSAL. A SPECIFIC SITE LOCATION FOR THIS LANDFILL HAS NOT BEEN DETERMINED. THE LANDFILL CELL WOULD BE APPROXIMATELY 25 ACRES IN PLAN AREA AND LINED WITH A DOUBLE SYNTHETIC MEMBRANE AND LEAK DETECTION SYSTEM. A LAYERED COVER SYSTEM CONSISTING OF A SYNTHETIC MEMBRANE WOULD BE USED. AS REQUIRED, A SIX-FOOT HIGH CHAIN LINK FENCE WITH A THREE-STRAND BARBED WIRE CROWN WOULD BE CONSTRUCTED AT THE LANDFILL PERMITTED FOR ACCESS CONTROL. THE ESTIMATED QUANTITIES OF MATERIALS INVOLVED ARE SHOWN IN TABLE 7-6.

OPERATING AND MAINTENANCE REQUIREMENTS

THE CLOSURE COVER WOULD BE INSPECTED ANNUALLY. ROUTINE MAINTENANCE, INCLUDING WEED CONTROL OR PARTIAL REVEGETATION, WOULD BE PERFORMED AS REQUIRED.

MONITORING REQUIREMENTS

VISUAL INSPECTION AND GROUND WATER MONITORING CONSISTENT WITH PERMIT REQUIREMENTS WOULD BE PERFORMED. A LEAK DETECTION SYSTEM FOR THE NEW LANDFILL WOULD ALSO BE REQUIRED.

OFF-SITE DISPOSAL

EXCAVATED WASTE CKD AND COMMINGLED MATERIALS WOULD BE DISPOSED OFF-SITE IN THE OFF-SITE, STATE APPROVED INDUSTRIAL LANDFILL.

EMISSIONS CONTROL

DUST SUPPRESSANTS WOULD BE USED DURING CONSTRUCTION ACTIVITIES TO MINIMIZE FUGITIVE DUST EMISSIONS. TRUCKS WOULD BE COVERED WITH TARPS DURING TRANSPORT OF WASTE MATERIALS TO THE LANDFILL SITE.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED. THESE RESTRICTIONS WOULD PROHIBIT SITE DEVELOPMENT THAT COULD DISTURB WASTE CKD SUCH THAT FUGITIVE DUST EMISSIONS WOULD BE GENERATED, RESULTING IN POTENTIAL HEALTH AND ENVIRONMENTAL RISKS.

RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

THE MAJOR MATERIAL MOVEMENT ACTIVITIES WILL BE A RESULT OF THE

EXCAVATION OF 380,000 CUBIC YARDS OF WASTE CKD FROM SITES 2 AND 3 AND 109,000 CUBIC YARDS OF WASTE CKD AND COMMINGLED MATERIAL FROM THE WEST SITE. SITE 2 CONTAINS WASTE CKD THAT WAS PLACED AS A SLURRY. THIS MATERIAL HAS DEVELOPED LAYERS OF HARDENED WASTE CKD. A BULLDOZER OR TRACKED FRONT LOADER EQUIPPED WITH A "RIPPING" TOOTH MAY BE REQUIRED TO BREAK UP THE CRUSTS BEFORE THE WASTE CKD CAN BE EXCAVATED.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 7C IS ESTIMATED TO BE \$12.5 MILLION. CAPITOL COSTS WERE ESTIMATED TO BE \$17.1 MILLION SPREAD OVER A FIVE YEAR PERIOD. OPERATION AND MAINTENANCE COSTS ARE ESTIMATED TO BE \$5,000 ANNUALLY FOR A PERIOD OF 30 YEARS.

COMPLIANCE WITH ARARS

REMOVAL OF WASTE CKD TO AN OFF-SITE LANDFILL WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THIS ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS. STATE SOLID WASTE REGULATIONS REQUIRE DISPOSAL IN A STATE APPROVED SITE. THIS ARAR WOULD BE MET.

THIS ALTERNATIVE WOULD ISOLATE ALL IDENTIFIABLE WASTE CKD FROM POTENTIAL FUTURE CONTACT WITH SITE GROUNDWATER. THE CAP PROPOSED FOR THE OFF-SITE LANDFILL EXCEEDS CURRENT LANDFILL COVER REQUIREMENTS AS STATED IN THOSE REGULATIONS. THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH ALL IDENTIFIED ARARS.

ALTERNATIVES WITH TREATMENT AS A MAJOR COMPONENT

ALTERNATIVE 11 (CKD/11) - SOLIDIFICATION WITH PORTLAND CEMENT AND ON-SITE REPLACEMENT

DESCRIPTION

WASTE CKD WOULD BE EXCAVATED AND MOVED TO AN ON-SITE LOCATION FOR PROCESSING AND MIXING WITH PORTLAND CEMENT. THE PORTLAND CEMENT WOULD BE ADDED IN PRESCRIBED AMOUNTS (CURRENTLY TARGETED AT 10 PERCENT ON A DRY WEIGHT BASIS) AND MIXED. MIXED MATERIALS WOULD BE MOISTURE CONDITIONED AS REQUIRED, PLACED BACK INTO EXCAVATED AREAS WITHIN THE SITE, AND COMPACTED. THE CODISPOSED WEST SITE WASTE CKD MAY REQUIRE SELECTIVE EXCAVATION AND THE REMOVAL OF LARGE CONSTRUCTION DEBRIS PRIOR TO FURTHER PROCESSING. CODISPOSED MATERIALS WOULD BE SEPARATED FROM WASTE CKD USING STANDARD SCREENING TECHNIQUES. EXCEPT FOR CHROME BRICK, THE CODISPOSED MATERIAL WOULD BE TRANSPORTED FOR DISPOSAL AT A LOCAL MUNICIPAL LANDFILL. THE STABILIZED WASTE CKD WOULD BE DEPOSITED ON-SITE IN A MANNER SIMILAR TO SOIL CEMENT TO PROVIDE A SUITABLE BASE FOR FUTURE COMMERCIAL DEVELOPMENT OF THE PROPERTY, UNLESS OTHER BENEFICIAL USES FOR THE STABILIZED WASTE CKD (E.G., PARKING LOT BASE MATERIAL) COULD BE DEVELOPED. EXCAVATED AREAS NOT FILLED WITH SOLIDIFIED MATERIAL WOULD BE RESTORED TO PRE-FILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIAL.

THE WASTE CKD AND CODISPOSED MATERIALS WOULD BE EXCAVATED USING A BACKHOE DRAGLINE, BULLDOZERS OR LOADERS AT SITES 2 AND 3, AND EITHER BACKHOES OR LOADERS AT THE WEST SITE, AND TRUCKED TO THE STABILIZATION PLANT. AT THE STABILIZATION PLANT, THE WASTE CKD WOULD BE DUMPED ON A STOCKPILE PAD. A FRONT END LOADER WOULD TRANSFER THE WASTE CKD TO THE FEED HOPPER OF THE TREATMENT SYSTEM. SELECTIVE EXCAVATION WOULD SEPARATE CHROME BRICK AND TEMPORARILY STORED ON-SITE. THE TREATED MATERIAL WOULD BE HAULED BACK TO PREVIOUSLY EXCAVATED AREAS, DUMPED, SPREAD AND COMPACTED.

EXCAVATED AREAS THAT ARE NOT FILLED WITH STABILIZED WASTE CKD WOULD BE RESTORED TO PRE-FILLED CONTOURS USING BANKRUN FILL MATERIALS. THE SAME EQUIPMENT USED TO HANDLE THE WASTE CKD WOULD BE USED TO PLACE THE

BANKRUN FILL.

IN ORDER TO AVOID HAULAGE ON PUBLIC ROADS AND MINIMIZE CROSSING OF THE CITY DRAIN WITH WASTE CKD, THE MIXING PLANT WOULD BE PORTABLE AND WOULD BE LOCATED AT EACH SITE. DUST WOULD BE CONTROLLED THROUGH THE APPLICATION OF WATER OR OTHER APPROPRIATE DUST SUPPRESSANTS.

FACILITY DESCRIPTION

THE PRIMARY ELEMENT OF THE MIXING PLANT WOULD BE A PUG MILL OR PADDLE MIXER TO BLEND PORTLAND CEMENT WITH THE WASTE CKD. TREATABILITY STUDIES INDICATE THAT THE HIGHEST STRENGTHS IN THE STABILIZED MATERIALS ARE ACHIEVED WITH LITTLE ADDED WATER SO WATER SPRAYS IN THE BLENDING MACHINE WILL PROVIDE SUFFICIENT ADDED MOISTURE. THE WASTE CKD WOULD BE FED TO THE PLANT BY A FRONT LOADER OVER A SLOPING GRIZZLY (BAR SCREEN) WITH 1-INCH OPENINGS OR A "WOBBLER" TYPE FEEDER. THIS SCREEN WOULD REMOVE CODISPOSED MATERIALS AND LARGE PIECES OF HARDENED WASTE CKD (AS FOUND ON SITE 2). THE LARGE PARTICLES WOULD FALL INTO A BIN AT ONE SIDE OF THE FEED HOPPER. THE COARSE MATERIAL WOULD BE SORTED MANUALLY INTO THREE CATEGORIES: CHROME BRICK, OTHER CODISPOSED NONHAZARDOUS MATERIALS, AND HARDENED PIECES OF WASTE CKD, AND PLACED IN INDIVIDUAL TEMPORARY STOCKPILES PENDING PROPER DISPOSAL.

SOME WASTE CKD ON SITE 2 HAS HARDENED TO A ROCK-LIKE CONSISTENCY. THIS MATERIAL WOULD BE SEGREGATED BY THE BAR SCREEN AND FED BY A FRONT END LOADER TO A JAW CRUSHER AFTER ANY CHROME BRICK OR OTHER WASTE HAS BEEN REMOVED. THE PRODUCT OF THE JAW CRUSHER WOULD BE RETURNED TO THE FEED HOPPER BY FRONT END LOADER. WATER SPRAYS WOULD BE USED TO CONTROL DUST FROM THE FINE, CRUSHED WASTE CKD. THE JAW CRUSHER WOULD BE EQUIPPED WITH A DUST CONTROL SYSTEM. ALL COLLECTED DUST WOULD BE FED TO THE MIXING PLANT.

THE FEED HOPPER WOULD BE LOCATED DIRECTLY OVER THE END OF THE PLANT SO THAT THE WASTE CKD WOULD FALL DIRECTLY INTO THE MIXER. AN OVERHEAD BIN WOULD FEED PORTLAND CEMENT BY GRAVITY FLOW THROUGH A ROTARY VANE FEEDER. SMALL QUANTITIES OF WATER WOULD BE ADDED TO ALLOW MIXING OF THE PORTLAND CEMENT AND PROCESSED WASTE CKD TO A HOMOGENEOUS CONDITION. THE PORTLAND CEMENT/WASTE CKD MIXTURE WOULD DISCHARGE BY GRAVITY ONTO A CONVEYOR WHICH WOULD PLACE THE MATERIAL IN DUMP TRUCKS. THE MIXED MATERIAL WOULD THEN BE HAULED BY DUMP TRUCKS TO THE REPLACEMENT AREAS.

THE ENTIRE PLANT WOULD BE MODULAR SO THAT IT COULD BE DISASSEMBLED AND TRANSPORTED TO A PREPARED PAD AT EACH SITE.

OPERATION AND MAINTENANCE REQUIREMENTS

THE FOLLOWING OPERATIONAL SCENARIO IS ASSUMED. THE OPERATION WOULD HANDLE 500,000 CUBIC YARDS OF WASTE CKD OVER 5 YEARS. OPERATIONS WOULD BE CONDUCTED FOR 8 HOURS PER DAY, 5 DAYS PER WEEK FOR APPROXIMATELY 200 OPERATING DAYS PER YEAR. THE PLANT WOULD BE DESIGNED TO PROCESS 62.5 CUBIC YARDS PER HOUR OR 500 DRY TONS PER DAY OF WASTE CKD. THE TOTAL PLANT DESIGN THROUGHPUT WOULD INCLUDE THE ADDITION OF PORTLAND CEMENT AT A RATE OF 200 POUNDS PER DRY TON OF WASTE CKD OR 6.25 TONS PER HOUR.

THIS OPERATION WOULD REQUIRE TWO FRONT END LOADERS, ONE WHEELED BULLDOZER, FOUR DUMP TRUCKS, AND THE SCREENING AND STABILIZATION PLANT. ELECTRIC POWER AND WATER WOULD BE NECESSARY FOR THE MIXING PLANT. THE POWER REQUIREMENTS ARE ESTIMATED TO BE LESS THAN 150 HORSEPOWER. WATER REQUIREMENTS OF 100 GPM COULD BE MET BY EITHER UTILITY HOOK UP, BY TANKER TRUCK, SURPLUS CANAL OR SITE WATER.

THE PORTLAND CEMENT WOULD BE BROUGHT TO THE SITE IN TANK TRUCKS AND PNEUMATICALLY CONVEYED TO A FEED BIN. ABOUT THIRTEEN 25-TON TRUCK LOADS OF PORTLAND CEMENT PER WEEK WOULD BE REQUIRED.

ONCE MATERIAL SOLIDIFICATION IS COMPLETE AT THE SITE, NO FUTURE OPERATION OR MAINTENANCE ACTIVITIES WOULD BE REQUIRED.

OFF-SITE DISPOSAL

AS DESCRIBED ABOVE, CODISPOSED MATERIALS WOULD BE SCREENED FROM THE WASTE CKD. NONHAZARDOUS MATERIALS SCREENED FROM THE WASTE CKD WOULD BE TRANSPORTED AND PROPERLY DISPOSED AT A LANDFILL PERMITTED TO RECEIVE SUCH MATERIALS.

EMISSIONS CONTROL

THE APPLICATION OF DUST SUPPRESSANTS DURING EXCAVATION AND CONSTRUCTION ACTIVITIES WOULD MINIMIZE THE POTENTIAL FOR THE DEVELOPMENT OF FUGITIVE DUST EMISSIONS. THE PORTLAND CEMENT SYSTEM AND MIXING PLANT WOULD BE ENCLOSED AND WATER SPRAYS WOULD BE USED TO CONTROL DUST. THE MIXED MATERIALS WOULD NOT HAVE A HIGH POTENTIAL TO GENERATE DUST DUE TO THEIR RELATIVELY HIGH WATER CONTENT.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED PENDING THE COMPLETION OF SOLIDIFICATION OF ALL WASTE CKD AT THE SITE. THESE RESTRICTIONS WOULD PROHIBIT SITE DEVELOPMENT THAT COULD DISTURB WASTE CKD SUCH THAT FUGITIVE DUST EMISSIONS WOULD BE GENERATED, RESULTING IN POTENTIAL HEALTH OR ENVIRONMENTAL RISKS.

RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 11 IS ESTIMATED TO BE \$15.1 MILLION. CAPITAL COST IS ESTIMATED TO BE \$18.2 MILLION, WHICH WOULD BE SPREAD OVER THE FIVE YEAR COMPLETION PERIOD. NO OPERATION AND MAINTENANCE COSTS ARE ANTICIPATED.

COMPLIANCE WITH ARARS

THE SOLIDIFICATION OF WASTE CKD WITH PORTLAND CEMENT WOULD ELIMINATE FUGITIVE DUST EMISSIONS FROM THE SITE, THEREBY CONTRIBUTING TO SITE-SPECIFIC LONG-TERM COMPLIANCE WITH FEDERAL AND STATE AIR QUALITY STANDARDS FOR TSP AND FUGITIVE DUST CONTROL. THE ACTION WOULD BE CONDUCTED USING APPROPRIATE DUST CONTROLS TO ENSURE SHORT-TERM COMPLIANCE WITH THESE STANDARDS.

AS A "SOLID MATERIAL RESULTING FROM INDUSTRIAL....OPERATIONS" (UTAH STATE TITLE 26, CHAPTER 14), SOLIDIFIED WASTE CKD MAY BE CONSIDERED A SOLID WASTE. STATE SOLID WASTE REGULATIONS SHOULD BE MET.

ALTERNATIVE 12 (CKD/12) - SOLIDIFICATION WITH CLASS C FLY ASH AND ON-SITE REPLACEMENT

DESCRIPTION

THIS ALTERNATIVE IS IDENTICAL TO ALTERNATIVE 11 EXCEPT THAT INSTEAD OF MIXING THE WASTE CKD WITH PORTLAND CEMENT, THE WASTE CKD WOULD BE MIXED WITH CLASS C FLY ASH. THE FLY ASH WOULD BE ADDED IN PRESCRIBED AMOUNTS (CURRENTLY TARGETED AT 20 PERCENT ON A DRY WEIGHT BASIS) AND MIXED.

THE FLY ASH WOULD BE ADDED AT A RATE OF 400 POUNDS PER DRY TON OF WASTE CKD, INSTEAD OF 200 POUNDS PER TON OF PORTLAND CEMENT AS IN ALTERNATIVE 11. THE PROCESSING PLANT WOULD BE DESIGNED TO ACHIEVE THE SAME THROUGHPUT OF WASTE CKD AS FOR ALTERNATIVE 11.

THE FLY ASH WOULD BE BROUGHT TO THE SITE IN TANKER TRUCKS AND PNEUMATICALLY CONVEYED TO A FEED BIN. TWENTY-FIVE 20 TON TRUCK LOADS OF CLASS C FLY ASH PER WEEK WOULD BE REQUIRED.

ONCE MATERIAL SOLIDIFICATION IS COMPLETE AT THE SITE, NO FURTHER OPERATION OR MAINTENANCE ACTIVITIES WOULD BE REQUIRED.

OFF-SITE DISPOSAL

AS FOR ALTERNATIVE 11, CODISPOSED MATERIALS WOULD BE SCREENED FROM THE WASTE CKD. CHROME BRICKS WOULD BE SEPARATED FROM OTHER CODISPOSED MATERIAL AND TEMPORARILY STORED ON-SITE. NONHAZARDOUS MATERIALS SCREENED FROM THE WASTE CKD WOULD BE TRANSPORTED AND PROPERLY DISPOSED AT A LANDFILL PERMITTED TO RECEIVE SUCH MATERIALS.

AS FOR ALTERNATIVE 11, THE APPLICATION OF DUST SUPPRESSANTS DURING EXCAVATION AND CONSTRUCTION ACTIVITIES WOULD MINIMIZE THE POTENTIAL FOR THE DEVELOPMENT OF FUGITIVE DUST EMISSIONS. THE FLY ASH SYSTEM AND MIXING PLANT WOULD BE ENCLOSED AND WATER SPRAYS WOULD BE USED TO CONTROL DUST.

INSTITUTIONAL CONTROLS REQUIRED

IDENTICAL INSTITUTION CONTROLS TO THOSE PROPOSED IN ALTERNATIVE 11 WOULD BE IMPLEMENTED.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 12 IS ESTIMATED TO BE \$15.5 MILLION. THE ALTERNATIVE COULD BE COMPLETED IN 5 YEARS. NO OPERATION AND MAINTENANCE COSTS ARE ANTICIPATED. CAPITAL COST IS ESTIMATED \$18.67 MILLION.

COMPLIANCE WITH ARARS

ALTERNATIVE 12 WOULD MEET THE SAME ARARS IDENTIFIED FOR ALTERNATIVE 11.

ALTERNATIVES RELYING ON REUSE OF WASTE CKD AS A RESOURCE

ALTERNATIVE 13 (CKD/13) - USE AS A RESOURCE WITH ON-SITE PROCESSING

DESCRIPTION

WASTE CKD WOULD BE EXCAVATED, SEPARATED FROM CODISPOSED MATERIALS, PROCESSED AS REQUIRED ON-SITE AND SHIPPED TO THE POINT OF BENEFICIAL USE BY TRUCK OR RAIL. SOME POTENTIAL USES OF WASTE CKD AS A RESOURCE INCLUDE:

- * FERTILIZER - WASTE CKD COULD BE APPLIED ALONE OR MIXED WITH OTHER INGREDIENTS TO UTILIZE THE POTASH CONTENT OF THE MATERIAL.
- * LIME SUBSTITUTE - WASTE CKD COULD BE USED AS A LIME SUBSTITUTE IN GOLD OR SILVER PRODUCTION AND IN WATER TREATMENT BY THE LIME-ALUM COAGULATION METHOD.
- * MINERAL FILLER - WASTE CKD COULD BE USED AS A MINERAL FILLER IN MASONRY UNITS (CONCRETE BLOCKS), ASPHALTIC ROOFING MATERIALS AND BITUMINOUS ASPHALTIC CONCRETE.
- * SLUDGE STABILIZATION - WASTE CKD COULD BE USED TO STABILIZE WASTE WATER TREATMENT PLANT SLUDGE. PATENTED PROCESSES ARE AVAILABLE WHEREBY SLUDGES ARE TREATED AND STABILIZED TO PRODUCE AN END PRODUCT THAT IS ESSENTIALLY ODORLESS, GRANULAR AND CONTAINS MANY PLANT NUTRIENTS AND VALUABLE ORGANIC MATERIALS.
- * WASTE STABILIZATION - WASTE CKD COULD BE USED ALONE OR WITH FLY ASH TO STABILIZE AND SOLIDIFY VARIOUS HAZARDOUS AND NON-HAZARDOUS WASTES.

EXCAVATED AREAS WOULD BE RESTORED TO PRE-FILLED CONTOURS USING BANKRUN

FILL MATERIALS. THE WASTE CKD PROCESSING FACILITY WOULD BE SECURED AS REQUIRED. THE CHROMIUM BRICKS WOULD BE SEPARATED AND TEMPORARILY STORED ON-SITE.

FOR PURPOSES OF DEVELOPING A COST ESTIMATE AND PERFORMING DETAILED EVALUATION OF THIS ALTERNATIVE, THE FOLLOWING EXCAVATION, PROCESSING, AND DISTRIBUTION SCENARIO HAS BEEN ASSUMED. WASTE CKD WOULD BE EXCAVATED AND TEMPORARILY STOCKPILED AT A PROCESSING PLANT LOCATED ON-SITE. SCREENING AND GRINDING OF THE WASTE CKD WOULD BE FOLLOWED BY FLASH DRYING. THE RESULTANT MATERIAL WOULD BE MARKETED AS A LIME SUBSTITUTE. ALL MATERIALS WOULD BE DISTRIBUTED BY TRUCK AN AVERAGE OF 50 MILES TO AN ASSUMED USE LOCATION. NO REVENUE FROM REUSE IS ASSUMED.

THE MATERIALS HANDLING REQUIREMENTS ARE SIMILAR TO THOSE DESCRIBED FOR ALTERNATIVE 11 FOR WASTE CKD EXCAVATION. ADDITIONAL HANDLING REQUIREMENTS WOULD BE A FUNCTION OF PROCESSING REQUIREMENTS OR ULTIMATE BENEFICIAL USE.

THE FOLLOWING PROCESS FACILITY HAS BEEN ASSUMED. A JAW CRUSHER WOULD BE USED FOR SIZE REDUCTION OF SCREENED MATERIALS PRIOR TO FEEDING THEM INTO A GAS HEATED FLASH DRIER AT A RATE OF 100 TONS PER HOUR. THE SYSTEM WOULD BE EQUIPPED WITH A BAGHOUSE FOR DUST CONTROL. DRIED PRODUCT WOULD BE STORED ON-SITE IN PORTABLE 120 TON CAPACITY STORAGE BINS.

OPERATION AND MAINTENANCE REQUIREMENTS

THE FOLLOWING OPERATIONAL SCENARIO HAS BEEN ASSUMED. A STAFF OF THREE PERSONS WOULD BE REQUIRED TO OPERATE THE PROCESSING FACILITY. EXCAVATION AND ON-SITE TRANSPORTATION OF EXCAVATED MATERIALS WOULD BE SUBCONTRACTED. PROCESSING WOULD BE PERFORMED ON THE BASIS OF A 40-HOUR WEEK FOR 9 MONTHS PER YEAR OVER A FOUR YEAR PERIOD.

OFF-SITE DISPOSAL

NON-HAZARDOUS MATERIALS SCREENED FROM THE WASTE CKD WOULD BE TRANSPORTED AND PROPERLY DISPOSED AT A LANDFILL PERMITTED TO RECEIVE SUCH MATERIALS.

EMISSIONS CONTROL

EMISSIONS CONSIDERATIONS OF WASTE CKD EXCAVATION ARE SIMILAR TO THOSE DISCUSSED FOR ALTERNATIVE 7A, 7B, AND 7C. ADDITIONAL EMISSIONS CONSIDERATIONS WOULD BE DEPENDENT ON PROCESSING ALTERNATIVES SELECTED AND ULTIMATE BENEFICIAL USE.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED. THESE RESTRICTIONS WOULD PROHIBIT SITE DEVELOPMENT THAT COULD DISTURB WASTE CKD SUCH THAT FUGITIVE DUST EMISSIONS WOULD BE GENERATED, RESULTING IN POTENTIAL HEALTH OR ENVIRONMENTAL RISKS.

RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 13 IS ESTIMATED TO BE \$16.1 MILLION. CASH FLOW FOR CAPITAL EXPENSES (\$19.2 MILLION) ARE SPREAD OVER AN ESTIMATED FIVE YEAR PERIOD FOR THE PURPOSE OF CALCULATING A PRESENT VALUE COST. THE TIME PERIOD MAY VARY DEPENDING ON THE END USE(S) IDENTIFIED.

COMPLIANCE WITH ARARS

THIS ALTERNATIVE IS EXPECTED TO MEET ALL OF THE IDENTIFIED ARARS.

ALTERNATIVE 13A (CKD/13A) - USE AS A RESOURCE WITHOUT ON-SITE PROCESSING

DESCRIPTION

ALTERNATIVE 13A IS IDENTICAL TO ALTERNATIVE 13 EXCEPT THAT THE WASTE CKD WOULD NOT RECEIVE ANY PROCESSING PRIOR TO ITS SHIPMENT FROM THE SITE. SOME POTENTIAL USES OF UNPROCESSED WASTE CKD AS A RESOURCE COULD INCLUDE:

- * SOIL STABILIZATION - UNSTABLE CLAYS COULD BE TREATED WITH WASTE CKD TO PROVIDE TEMPORARY OR PERMANENT STABILITY AT A CONSTRUCTION SITE.
- * CATTLE FEED - WASTE CKD COULD BE USED AS A BINDER IN ALFALFA PELLETS OR AS A NUTRIENT SUPPLEMENT IN CATTLE FEED.
- * ACID NEUTRALIZATION (MINE WASTE, ETC.) - WASTE CKD COULD BE USED TO NEUTRALIZE ACID WASTES FROM INDUSTRIAL PROCESS, ACID MINE DRAINAGE, ACID MINE WASTE PILES AND LEACHATE FROM HAZARDOUS AND SANITARY LANDFILLS.
- * PAVING - WASTE CKD COULD BE MIXED WITH SOIL TO PRODUCE A SOIL CEMENT-LIKE PAVING BASE, MIXED WITH CONSTRUCTION AGGREGATE TO PRODUCE A PAVING BASE, OR MIXED WITH FLY ASH TO DEVELOP A PAVING SUB-BASE.
- * SANITARY LANDFILL DAILY COVER - WASTE CKD COULD BE USED FOR DAILY COVER OR AS A COMPOSTING AID FOR VEGETABLE MATTER IN A SANITARY LANDFILL. THE SALT LAKE VALLEY MUNICIPAL SOLID WASTE LANDFILL HAS BEEN IDENTIFIED AS A POTENTIAL USER OF WASTE CKD FOR THESE PURPOSES. WASTE CKD COULD PROVIDE AN ECONOMICAL MEANS TO SATISFY OR SUPPLEMENT THE COUNTY'S FUTURE DAILY COVER REQUIREMENTS.

FOR PURPOSES OF DEVELOPING A COST ESTIMATE AND PERFORMING DETAILED EVALUATION OF THIS ALTERNATIVE OPTION, THE FOLLOWING EXCAVATION AND USE AS A RESOURCE SCENARIO HAS BEEN ASSUMED. WASTE CKD WOULD BE EXCAVATED AND TRANSPORTED DIRECTLY TO THE SALT LAKE COUNTY LANDFILL FOR USE AS A DAILY COVER. ABOUT 400 CUBIC YARDS PER DAY OF WASTE CKD WOULD BE HAULED BY TRUCK TO THE LANDFILL. FOR THE PURPOSES OF COST ESTIMATING, IT HAS BEEN ASSUMED THAT THE COST FOR EXCAVATION AND TRANSPORTATION WOULD BE A REMEDIATION COST. NO TIPPING FEES HAVE BEEN CONSIDERED. THE COST OF FURTHER PROCESSING OF THE WASTE CKD, SUCH AS SLURRYING OR PELLETIZING HAS NOT BEEN CONSIDERED. WASTE CKD FROM THE SITE, WHEN COMPARED TO OTHER POTENTIAL SOURCES OF DAILY COVER MATERIALS, HAS A POTENTIAL VALUE AS A RESOURCE TO THE LANDFILL. THIS RESOURCE VALUE HAS NOT BEEN CONSIDERED IN THE ANALYSES THAT FOLLOW. THE CHROMIUM BRICKS WOULD BE SEPARATED AND TEMPORARILY STORED ON-SITE.

OPERATION AND MAINTENANCE REQUIREMENTS

FOR PURPOSES OF DEVELOPING A COST ESTIMATE AND PERFORMING DETAILED EVALUATION OF THIS ALTERNATIVE, THE FOLLOWING OPERATIONAL SCENARIO HAS BEEN ASSUMED. EXCAVATION AND TRANSPORTATION OF WASTE CKD TO THE LANDFILL HAS BEEN ASSUMED TO BE ON THE BASIS OF A 40-HOUR WEEK FOR 9 MONTHS PER YEAR OVER A FIVE YEAR PERIOD.

OFF-SITE DISPOSAL

NON-HAZARDOUS MATERIALS SCREENED FROM THE WASTE CKD WOULD BE TRANSPORTED AND PROPERLY DISPOSED AT A LANDFILL PERMITTED TO RECEIVE SUCH MATERIALS.

EMISSIONS CONTROL

EMISSIONS CONSIDERATIONS FOR WASTE CKD EXCAVATION ARE SIMILAR TO THOSE DISCUSSED IN ALTERNATIVE 7A-7C. ADDITIONAL EMISSIONS CONSIDERATIONS WOULD BE DEPENDENT ON THE ULTIMATE BENEFICIAL USE.

INSTITUTIONAL CONTROLS REQUIRED

TEMPORARY DEED RESTRICTIONS WOULD BE IMPOSED. THESE RESTRICTIONS WOULD PROHIBIT SITE ACTIVITIES THAT COULD DISTURB WASTE CKD AND GENERATE FUGITIVE DUST EMISSIONS.

RESTRICTIONS WOULD BE IMPOSED TO PROHIBIT THE CONSTRUCTION OF WELLS ON OR ADJACENT TO THE SITE AND WITHDRAWAL OF AFFECTED NEAR-SURFACE GROUND WATER.

COST AND IMPLEMENTATION TIME

THE PRESENT VALUE OF THE TOTAL COST OF ALTERNATIVE 13A IS ESTIMATED TO BE \$7.8 MILLION. NO OPERATION AND MAINTENANCE COSTS ARE ANTICIPATED. CASH FLOW FOR CAPITAL EXPENSES (\$9.3 MILLION) ARE SPREAD OVER THE ESTIMATED COMPLETION TIME OF FIVE YEARS FOR THE PURPOSE OF CALCULATING A PRESENT VALUE COST. HOWEVER, THE TIME PERIOD MAY VARY DEPENDING ON THE END USE IDENTIFIED.

COMPLIANCE WITH ARARS

THIS ALTERNATIVE IS EXPECTED TO COMPLY WITH ALL OF THE ARARS IDENTIFIED.

#SCA

8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

THIS SECTION OF THE ROD EVALUATES THE RELATIVE PERFORMANCE OF THE ALTERNATIVES WITH RESPECT TO THE NINE CRITERIA DEVELOPED BY THE EPA TO GUIDE THE REMEDY SELECTION PROCESS. THE CRITERIA AGAINST WHICH EACH OF THE ALTERNATIVES IS TO BE COMPARED ARE SUMMARIZED BELOW:

- * OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT ADDRESSES WHETHER OR NOT A REMEDY WILL REMEDIATE A SITE SUCH THAT THE RESULTING RISKS TO THE PUBLIC AND THE ENVIRONMENT ARE WITHIN AN ACCEPTABLE LEVEL.
- * COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) ADDRESS WHETHER OR NOT A REMEDY WILL MEET ALL OF THE REQUIREMENTS OF ENVIRONMENTAL STATUTES AND/OR PROVIDE GROUNDS FOR INVOKING A WAIVER.
- * LONG-TERM EFFECTIVENESS AND PERMANENCE REFERS TO THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME ONCE CLEANUP GOALS HAVE BEEN MET.
- * REDUCTION OF TOXICITY, MOBILITY, OR VOLUME REFERS TO THE STATUTORY PREFERENCE TO REDUCE TOXICITY, MOBILITY, OR VOLUME OF HAZARDOUS SUBSTANCES THROUGH TREATMENT.
- * SHORT-TERM EFFECTIVENESS REFERS TO CONCERNS ABOUT PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT WHICH MAY ARISE DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD UNTIL CLEANUP GOALS ARE MET AND THE TIME REQUIRED TO ACHIEVE THE CLEANUP GOALS.
- * IMPLEMENTABILITY IS THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY, INCLUDING THE AVAILABILITY OF MATERIALS AND SERVICES NEEDED TO IMPLEMENT THE CHOSEN ALTERNATIVE.
- * COST EFFECTIVENESS COMPARES THE COST OF ALTERNATIVES THAT ACHIEVE THE SAME PROTECTIVENESS. EPA'S GOAL IS TO CHOOSE THE LESS COSTLY OF SIMILARLY PROTECTIVE REMEDIES. COST EFFECTIVENESS INCLUDES CAPITAL COSTS, OPERATING AND MAINTENANCE COSTS, AND PRESENT WORTH COSTS.

- * STATE ACCEPTANCE EVALUATES THE TECHNICAL AND ADMINISTRATIVE ISSUES AND CONCERNS THE STATE OF UTAH MAY HAVE REGARDING EACH OF THE ALTERNATIVES.
- * COMMUNITY ACCEPTANCE EVALUATES THE ISSUES AND CONCERNS EXPRESSED BY THE PUBLIC IN COMMENTS RECEIVED THROUGH PUBLIC HEARINGS, LETTERS, AND OTHER MEDIA. COMMUNITY ACCEPTANCE IS EVALUATED ONCE PUBLIC COMMENTS ON THE RI/FS AND REVISED PROPOSED PLAN HAVE BEEN RECEIVED. A THOROUGH SUMMARY OF PUBLIC COMMENTS AND RESPONSES TO THOSE COMMENTS IS PRESENTED IN THE RESPONSIVENESS SUMMARY OF THIS ROD.

THE FIRST TWO CRITERIA ARE CONSIDERED "THRESHOLD" FACTORS; ALTERNATIVES MUST MEET THESE CRITERIA TO BE RETAINED FOR FURTHER CONSIDERATION. THE NEXT FIVE CRITERIA ARE CONSIDERED "PRIMARY BALANCING" FACTORS, AND ARE THE PRIMARY CRITERIA UPON WHICH THE ANALYSIS IS BASED. THE LAST TWO CRITERIA ARE TERMED "MODIFYING" CONSIDERATIONS.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

A VARIETY OF REMEDIATION METHODS ARE EMPLOYED IN THE VARIOUS ALTERNATIVES TO REDUCE OR CONTROL THE RISKS ASSOCIATED WITH THE WASTE CKD. THE "NO ACTION" ALTERNATIVE DOES NOT PROVIDE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT AND THEREFORE WILL NOT BE CONSIDERED IN THE EVALUATIONS OF THE REMAINING CRITERIA. SEPARATION, TEMPORARY STORAGE OF THE CHROMIUM-BEARING REFRACTORY KILN BRICKS WILL OCCUR UNDER ALL OF THE ALTERNATIVES PRESENTED EXCEPT THE "NO ACTION" ALTERNATIVE. TREATMENT AND DISPOSAL OF THE CHROMIUM BRICKS WILL BE ADDRESSED UNDER SUBSEQUENT OPERABLE UNIT(S).

ALTERNATIVES 13 AND 13A INVOLVE USE OF THE WASTE CKD AS A RESOURCE. UPON COMPLETION OF REMEDIAL ACTIVITIES ALL LONG TERM POTENTIAL EXPOSURE PATHWAYS WOULD BE ELIMINATED AND THERE WOULD NOT BE ANY LONG-TERM MONITORING OR MAINTENANCE REQUIREMENTS. BENEFICIAL REUSES WOULD BE SELECTED TO MINIMIZE HEALTH AND ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE REMEDIATION. IT APPEARS UNLIKELY THAT ALL OF THE WASTE CKD COULD BE REMEDIATED UNDER THIS SCENARIO IN A TIMELY MANNER, SINCE NO MARKETS FOR REUSE OF THE WASTE CKD WERE IDENTIFIED.

ALTERNATIVES 6, 7B, AND 7C PROVIDE FOR TOTAL CONTAINMENT OF THE WASTE CKD THEREBY ELIMINATING POTENTIAL EXPOSURES THROUGH INHALATION, INGESTION, AND DERMAL CONTACT. THESE ALTERNATIVES INCLUDE A BOTTOM DOUBLE-LINER WHICH SHOULD ELIMINATE THE POSSIBILITY OF FURTHER CONTAMINATION OF GROUNDWATER RESOURCES. ALTERNATIVE 7B WOULD BE LOCATED IN A REMOTE AREA IN TOOELE COUNTY. ALTERNATIVE 7C WOULD BE LOCATED IN AN AREA THAT ALREADY CONTAINS A NUMBER OF INDUSTRIAL AND MUNICIPAL LANDFILLS AND IS SOMEWHAT ISOLATED RELATIVE TO THE EXISTING SITE. ALTERNATIVE 6 CONTAINS THE WASTE CKD ON-SITE IN A HIGHLY INDUSTRIALIZED AND URBANIZED AREA.

ALTERNATIVES 5 AND 7A PROVIDE FOR CONSOLIDATION AND CAPPING OF THE WASTE CKD THEREBY ELIMINATING POTENTIAL EXPOSURES THROUGH INHALATION, INGESTION AND DERMAL CONTACT. HOWEVER, THESE ALTERNATIVES DO NOT INCLUDE BOTTOM LINERS AND CONSEQUENTLY ARE NOT AS PROTECTIVE OF GROUND WATER. ALTERNATIVE 7A INVOLVES PLACEMENT AND CAPPING OF THE WASTE CKD IN AN UNLINED LIMESTONE QUARRY IN TOOELE COUNTY, WHEREAS ALTERNATIVE 5 IS CONSOLIDATION AND CAPPING ON-SITE, WITH NO BOTTOM LINER.

ALTERNATIVES 11 AND 12 INVOLVE SOLIDIFICATION OF THE WASTE CKD THROUGH MIXING WITH PORTLAND CEMENT AND FLY ASH RESPECTIVELY. THESE ALTERNATIVES WOULD APPARENTLY RESULT IN A REDUCTION OF THE LONG-TERM RISKS ASSOCIATED WITH THE SITE. HOWEVER, THESE TECHNOLOGIES HAVE NOT BEEN THOROUGHLY TESTED FOR LONG-TERM PHYSICAL STABILITY AND LONG-TERM RESISTANCE TO LEACHING WHEN EXPOSED TO MOISTURE, AND CONSEQUENTLY MAY NOT PROVIDE OVERALL PROTECTION OF HEALTH AND THE ENVIRONMENT IN THE FUTURE.

COMPLIANCE WITH ARARS

TABLE 7-1 LISTS THE ARARS THAT HAVE BEEN IDENTIFIED FOR WASTE CKD REMEDIAL ACTIONS AND CATEGORIZES THEM AS APPLICABLE OR RELEVANT AND APPROPRIATE. AN EVALUATION OF EACH ALTERNATIVES ABILITY TO MEET ARARS IS PRESENTED IN TABLE 8-1. ALL OF THE ALTERNATIVES WOULD COMPLY WITH THEIR RESPECTIVE ARARS EXCEPT ALTERNATIVE 1. HOWEVER, THE ALTERNATIVES MAY DIFFER IN THE COMPLEXITY OF THE METHODS BY WHICH THE ARARS ARE MET. SOME ALTERNATIVES REQUIRE MORE ENGINEERING CONTROLS, INSTITUTIONAL CONTROLS, OR INVOLVE ADMINISTRATIVE AND MONITORING REQUIREMENTS THAT OTHERS DO NOT.

THE PRIMARY ARARS ASSOCIATED WITH ALTERNATIVES 5, 6, 7A, 7B, AND 7C ARE THE SOLID WASTE DISPOSAL REGULATIONS, THE CLEAN AIR REGULATIONS, AND STATE CORRECTIVE ACTION CLEAN-UP STANDARDS. ALL OF THESE ALTERNATIVES WOULD COMPLY WITH THESE ARARS. HOWEVER, IN THE ABSENCE OF A BOTTOM LINER, ALTERNATIVES 5 AND 7A WOULD NOT BE AS EFFECTIVE IN MEETING THE UTAH CORRECTIVE ACTION CLEAN-UP STANDARDS.

THE PRIMARY ARARS ASSOCIATED WITH ALTERNATIVES 13 AND 13A ARE THE CLEAN AIR REGULATIONS AND THE UTAH CORRECTIVE ACTION CLEAN-UP STANDARDS. THESE ALTERNATIVES WOULD COMPLY WITH THESE ARARS. HOWEVER, THE OPEN-ENDED TIME FRAMES POTENTIALLY ASSOCIATED WITH IMPLEMENTATION OF THESE ALTERNATIVES COULD RESULT IN LONG TERM MONITORING AND MAINTENANCE TO ENSURE COMPLIANCE WITH THE ARARS.

THE PRIMARY ARARS ASSOCIATED WITH ALTERNATIVES 11 AND 12 ARE THE SOLID WASTE DISPOSAL REGULATIONS, THE CLEAN AIR REGULATIONS AND THE UTAH HAZARDOUS WASTE DISPOSAL REGULATIONS FOR THE DISPOSAL OF THE CHROMIUM-BEARING REFRACTORY KILN BRICKS. IT IS EXPECTED THAT THESE ALTERNATIVES WOULD COMPLY WITH THESE ARARS. HOWEVER, THE QUESTIONS REGARDING THE LONG-TERM STABILITY AND RESISTANCE TO LEACHING OF THESE REMEDIES COULD RESULT IN NON-COMPLIANCE WITH THE ARARS IN THE FUTURE.

LONG TERM EFFECTIVENESS AND PERMANENCE

IMPLEMENTATION OF ALTERNATIVES 13 AND 13A WOULD RESULT IN THE HIGHEST DEGREE OF LONG-TERM EFFECTIVENESS AND PERMANENCE BECAUSE THESE ALTERNATIVES WOULD RESULT IN REUSE OF THE WASTE CKD FOR BENEFICIAL PURPOSES. THERE WOULD BE NO LONG-TERM MONITORING ASSOCIATED WITH THESE ALTERNATIVES AND THE SITE WOULD BE AVAILABLE FOR ANY FUTURE USE.

REMEDIATION UNDER ALTERNATIVES 6, 7B, AND 7C WOULD RESULT IN TOTAL CONTAINMENT OF THE WASTE CKD IN AN ENGINEERED LANDFILL. PROVEN CONSTRUCTION AND ENGINEERING TECHNIQUES WOULD BE USED FOR IMPLEMENTATION OF THESE ALTERNATIVES AND LONG-TERM MONITORING AND MAINTENANCE WOULD BE REQUIRED. ALTERNATIVE 6 WOULD BE LOCATED AT THE EXISTING SITE WHICH IS INDUSTRIALIZED AND URBANIZED. FUTURE USE OF THE WEST SITE WOULD BE LIMITED UNDER ALTERNATIVE 6 DUE TO CONTAINMENT OF THE WASTE CKD ON-SITE. UNDER ALTERNATIVE 6, REPLACEMENT OF A REMEDY COMPONENT WOULD SUBJECT AN INCREASINGLY URBAN COMMUNITY TO INCREASED RISKS.

ALTERNATIVE 5 AND 7A REQUIRE CAPPING OF THE WASTE CKD BUT DO NOT INCLUDE BOTTOM LINERS. IN THE ABSENCE OF A BOTTOM LINER, THESE ALTERNATIVES DO NOT PROVIDE EFFECTIVE PROTECTION OF GROUND WATER. LONG-TERM MONITORING AND MAINTENANCE WOULD BE REQUIRED FOR THESE ALTERNATIVES.

ALTERNATIVES 11 AND 12 USE UNPROVEN TECHNOLOGIES AND CONSEQUENTLY THEIR LONG-TERM EFFECTIVENESS AND PERMANENCE ARE QUESTIONABLE. THESE ALTERNATIVES WOULD ALSO REQUIRE LONG-TERM MONITORING AND MAINTENANCE, AND WOULD LIMIT THE FUTURE USE OF THE SITE.

REDUCTION IN TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

ALL OF THE ALTERNATIVES UNDER CONSIDERATION INCLUDE REMOVAL OF THE CHROMIUM BEARING REFRACTORY KILN BRICK FROM THE WASTE CKD. THE REMOVAL OF THE BRICK WILL SIGNIFICANTLY REDUCE THE CONCENTRATION AND/OR POTENTIAL FOR LEACHING OF CHROMIUM IN THE WASTE CKD. TREATMENT OF THE KILN BRICK TO REDUCE TOXICITY WILL BE REQUIRED PRIOR TO THEIR DISPOSAL

UNDER A SUBSEQUENT OPERABLE UNIT.

THROUGH REUSE AS A RESOURCE, ALTERNATIVES 13 AND 13A MAY NOT REDUCE THE TOXICITY, MOBILITY, OR VOLUME OF THE WASTE CKD. HOWEVER, THE WASTE CKD WILL BE IN A STATE THAT REDUCES OR ELIMINATES EXPOSURE, AND PROVIDES A BENEFICIAL USE FOR THE MATERIAL.

ALTERNATIVES 11 AND 12 REDUCE THE TOXICITY AND MOBILITY OF THE WASTE CKD THROUGH TREATMENT. HOWEVER, BOTH ALTERNATIVES RESULT IN AN INCREASE IN VOLUME OF MATERIAL AND THE ABILITY OF THESE ALTERNATIVES TO MAINTAIN THEIR EFFECTIVENESS OVER TIME IS UNPROVEN.

ALTERNATIVES 5, 6, 7A, 7B, AND 7C REDUCE THE MOBILITY OF THE CONTAMINANTS THROUGH CONTAINMENT OR CAPPING OF THE WASTE CKD, BUT DO NOT EMPLOY TREATMENT TECHNIQUES. NONE OF THESE ALTERNATIVES REDUCE THE TOXICITY OR VOLUME OF THE WASTE CKD. ALTERNATIVES 5 AND 7A, WHICH HAVE NO BOTTOM LINER, WILL BE LESS EFFECTIVE IN REDUCING MOBILITY OF CONTAMINANTS IN GROUNDWATER.

SHORT-TERM EFFECTIVENESS

ALL OF THE ALTERNATIVES UNDER CONSIDERATION REQUIRE EXTENSIVE EXCAVATION AND EARTH MOVING, WHICH REQUIRES DETAILED ATTENTION TO COMMUNITY AND WORKER SAFETY. APPROPRIATE SAFETY CONTROLS WILL BE IMPLEMENTED TO LIMIT ALL EXPOSURES DURING THE CONSTRUCTION PHASE OF THE REMEDIATION.

ALTERNATIVES 11 AND 12 ALSO REQUIRE EXTENSIVE ON-SITE HANDLING OF THE WASTE CKD. UNDER THESE ALTERNATIVES THE WASTE CKD WOULD BE HANDLED ONLY ONCE, AND IT WOULD BE ENTIRELY ON-SITE. THERE WOULD BE NO OFF-SITE TRANSPORTATION REQUIRED. THESE ALTERNATIVES WOULD REQUIRE APPROXIMATELY 5 YEARS TO IMPLEMENT.

ALTERNATIVES 7A, 7B, 7C, 13, AND 13A WOULD ALSO REQUIRE THE WASTE CKD TO BE HANDLED ONLY ONCE. HOWEVER, THESE ALTERNATIVES WOULD REQUIRE OFF-SITE TRANSPORTATION OF THE WASTE CKD. UNDER ALTERNATIVES 7A, 7B AND 7C, THE LANDFILL DESIGN, PERMITTING, AND CONSTRUCTION WOULD REQUIRE APPROXIMATELY 3 YEARS AND WASTE CKD MOVEMENT WOULD REQUIRE ABOUT 2 YEARS, ASSUMING A RATE OF 1400 TONS/DAY. ALTERNATIVES 13 OR 13A WOULD REQUIRE APPROXIMATELY 5 YEARS TO IMPLEMENT.

ALTERNATIVES 5 AND 6 WOULD REQUIRE DOUBLE HANDLING OF SOME OF THE WASTE CKD, THEREBY INCREASING THE POTENTIAL FOR SHORT-TERM EXPOSURE TO FUGITIVE DUST. THESE ALTERNATIVES WOULD NOT REQUIRE OFF-SITE TRANSPORTATION OF THE WASTE CKD WHICH WOULD ELIMINATE THE RISKS ASSOCIATED WITH TRUCK TRAFFIC. REMEDIATION UNDER THESE SCENARIOS WOULD REQUIRE APPROXIMATELY 2 YEARS FOR ALTERNATIVE 5 AND 3 YEARS FOR ALTERNATIVE 6.

IMPLEMENTABILITY

ALL OF THE ALTERNATIVES UNDER CONSIDERATION EMPLOY KNOWN CONSTRUCTION AND ENGINEERING TECHNIQUES THAT REQUIRE SERVICES AND MATERIALS THAT ARE

READILY AVAILABLE. THERE ARE DIFFERENCES BETWEEN THE ALTERNATIVES IN TERMS OF THE EASE OF IMPLEMENTATION, AND THE ADMINISTRATIVE REQUIREMENTS ASSOCIATED WITH IMPLEMENTATION OF A SPECIFIC ALTERNATIVE.

ALTERNATIVES 5 AND 6 RESULT IN REMEDIATION WHERE THE WASTE CKD REMAINS ON THE PRESENT SITE, THEREFORE NO PERMITS WOULD BE REQUIRED, BUT SUBSTANTIVE PERMIT REQUIREMENTS WOULD BE MET. MATERIALS AND EQUIPMENT REQUIRED TO IMPLEMENT THESE ALTERNATIVES ARE READILY AVAILABLE IN THE LOCAL AREA. CONSTRUCTION ACTIVITIES FOR ALTERNATIVE 6 WOULD BE SOMEWHAT MORE COMPLICATED THAN ALTERNATIVE 5.

THE MATERIALS AND EQUIPMENT REQUIRED TO IMPLEMENT ALTERNATIVES 7A, 7B AND 7C ARE ALSO READILY AVAILABLE. ALTERNATIVE 7A IS SOMEWHAT LESS COMPLICATED TO IMPLEMENT DUE TO THE ABSENCE OF A BOTTOM LINER. ALL OF

THESE ALTERNATIVES REQUIRE TRANSPORT OF THE WASTE CKD TO AN OFF-SITE LOCATION, WHICH REQUIRES COMPLIANCE WITH ALL PERMITTING AND ADMINISTRATIVE REQUIREMENTS AT THE NEW LANDFILL SITE. THE TOOELE COUNTY COMMISSION HAS ADVISED THE STATE OF UTAH THAT ALTERNATIVES 7A AND 7B ARE UNACCEPTABLE SINCE THESE DISPOSAL SITES LIE OUTSIDE THE COUNTY'S HAZARDOUS INDUSTRY ZONE FOR SUCH FACILITIES. CONSEQUENTLY, THESE TWO ALTERNATIVES ARE NOT IMPLEMENTABLE.

ALTERNATIVES 11 AND 12 ALSO EMPLOY MATERIALS AND EQUIPMENT THAT ARE READILY AVAILABLE. THE TECHNICAL COMPLEXITY IS INCREASED DUE TO THE PROCESSING REQUIRED AS PART OF THE REMEDIATION. BECAUSE THE REMEDIATION WOULD BE CONDUCTED ON THE PRESENT SITE, NO PERMITS WOULD BE REQUIRED, BUT SUBSTANTIVE PERMIT REQUIREMENTS WOULD BE MET.

CONVENTIONAL CONSTRUCTION AND EARTH MOVING METHODS WOULD BE USED FOR ALTERNATIVES 13 AND 13A. THE ADDITIONAL PROCESSING REQUIRED FOR ALTERNATIVE 13 INCREASES THE LEVEL OF TECHNICAL COMPLEXITY. IMPLEMENTATION OF THESE ALTERNATIVES REQUIRES THE IDENTIFICATION OF USERS OR MARKETS FOR THE WASTE CKD. BASED ON CURRENT INFORMATION THE USERS AND MARKETS DO NOT APPARENTLY EXIST, THEREBY SIGNIFICANTLY EFFECTING THE IMPLEMENTABILITY OF THESE ALTERNATIVES.

COST ANALYSIS

COST CALCULATIONS FOR EACH REMEDY INVOLVED A STANDARD METHODOLOGY TO MAKE COMPARISON POSSIBLE. CAPITAL COSTS IN FUTURE DOLLARS WERE ESTIMATED, INCLUDING A CONTINGENCY. OPERATION AND MAINTENANCE COSTS WERE CALCULATED SEPARATELY FOR THE PERIOD BEGINNING WITH THE END OF THE CONSTRUCTION PORTION OF THE PROJECT. OPERATION AND MAINTENANCE, IF REQUIRED, WAS ASSUMED TO CONTINUE FOR A STANDARD 30 YEAR PERIOD. THE PRESENT VALUE OF THE TOTAL COST WAS CALCULATED BY ASSUMING THE PRESENT VALUE OF THE CAPITAL COSTS AND OPERATION AND MAINTENANCE COSTS. PRESENT VALUE OF TOTAL COSTS ASSUMES A 10 PERCENT DISCOUNT RATE. CAPITAL COSTS WERE SPREAD OVER THE DURATION OF THE CONSTRUCTION PERIOD TO CALCULATE THEIR PRESENT VALUE. OPERATION AND MAINTENANCE COSTS (IF REQUIRED) WERE ASSUMED FOR A 30-YEAR PERIOD FOLLOWING COMPLETION OF CONSTRUCTION.

AS EXPLAINED IN THE BEGINNING OF CHAPTER 7, THE SPECIFIC COST FOR THE ALTERNATIVES (EXCEPT THE "NO ACTION" ALTERNATIVE) HAVE NOT BEEN CHANGED TO REFLECT THE STORAGE OF THE CHROMIUM BRICKS UNDER THIS OPERABLE UNIT. THE COST LISTED IN THIS CHAPTER REFLECT THE TRANSPORT AND DISPOSAL OF THE CHROMIUM BRICKS AT A RCRA SUBTITLE C FACILITY, WHICH WAS ESTIMATED TO BE APPROXIMATELY \$60,800. AS DESCRIBED PREVIOUSLY, THE CHROMIUM BRICKS WILL BE SEPARATED AND TEMPORARILY STORED AT AN ACCEPTABLE ON-SITE LOCATION. THE ALTERNATIVES ARE PRESENTED IN THE ORDER OF LEAST TO GREATEST COST.

ALTERNATIVE 13A: USE AS A RESOURCE WITHOUT ON-SITE PROCESSING

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 13A (CKD/13A)			
SITES 2 AND 3	\$ 6,340	\$ 0	\$ 5,290
WEST SITE	\$ 3,010	\$ 0	\$ 2,510
		TOTAL	\$ 7,800

ALTERNATIVE 5: CONSOLIDATION OF WASTE CKD AT THE WEST SITE

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 5 (CKD/5)			
SITES 2 AND 3	\$ 7,133	\$ 3.9	\$ 6,548
WEST SITE	\$ 2,011	\$ 1.1	\$ 1,847
		TOTAL	\$ 8,395

ALTERNATIVE 7A: EXCAVATION AND DISPOSAL OFF-SITE AT THE FLUX QUARRY
SITE IN TOOELE COUNTY

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 7A (CKD/7A)			
SITES 2 & 3	\$ 12,035	\$ 1.4	\$ 8,338
WEST SITE	\$ 3,008	\$ 0.3	\$ 2,085
		TOTAL	\$ 10,423

ALTERNATIVE 6: EXCAVATION AND DISPOSAL ON-SITE

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 6 (CKD/6)			
SITES 2 AND 3	\$ 7,395	\$ 3.0	\$ 6,765
WEST SITE	\$ 5,070	\$ 2.0	\$ 4,640
		TOTAL	\$ 11,405

ALTERNATIVE 7C: EXCAVATION AND DISPOSAL OFF-SITE IN THE VICINITY OF THE
SALT LAKE VALLEY LANDFILL

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 7C (CKD/7C)			
SITES 2 AND 3	\$ 13,679	\$ 4.0	\$10,015
WEST SITE	\$ 3,420\$	1.0	\$ 2,503
		TOTAL	\$ 12,518

ALTERNATIVE 11: SOLIDIFICATION WITH PORTLAND CEMENT, ON-SITE
REPLACEMENT

CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
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ALTERNATIVE 11			
(CKD/11)			
SITES 2 AND 3	\$13,935	\$ 0	\$ 11,620
WEST SITE	\$ 4,220	\$ 0	\$ 3,520
		TOTAL	\$15,140

ALTERNATIVE 12: SOLIDIFICATION WITH FLY ASH AND ON-SITE REPLACEMENT

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE
(X1000)			
ALTERNATIVE 12 (CKD/12)			
SITES 2 AND 3	\$14,270	\$ 0	\$11,900
WEST SITE	\$ 4,400	\$ 0	\$ 3,670
		TOTAL	\$15,570

ALTERNATIVE 13: USE AS A RESOURCE WITH ON-SITE PROCESSING

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 13 (CKD/13)			
SITES 2 AND 3	\$14,875	\$ 0	\$12,405
WEST SITE	\$ 4,390390	\$ 0	\$ 3,660
		TOTAL	\$16,065

ALTERNATIVE 7B: EXCAVATION AND DISPOSAL OFF-SITE WITHIN THE TOOELE COUNTY HAZARDOUS WASTE EXCLUSION ZONE

	CAPITAL COST (X1000)	ANNUAL O&M EXPENSE (X1000)	PRESENT VALUE (X1000)
ALTERNATIVE 7B (CKD/7B)			
SITES 2 & 3	\$ 20,380	\$ 4.0	\$ 14,900
WEST SITE	\$ 5,095	\$ 1.0	\$ 3,725
		TOTAL	\$ 18,625

THE STATE OF UTAH HAS REVIEWED ALL OF THE ABOVE COST ESTIMATES, INCLUDING THE REVISED ESTIMATES TAKEN FROM THE MARCH 20, 1990 FS ADDENDUM INFORMATION. THE STATE BELIEVES THAT THE ESTIMATED COSTS FOR ALTERNATIVE 6 ARE UNDER ESTIMATED WHEN COMPARED TO ALTERNATIVES 7B AND 7C BECAUSE THE LATTER TWO ALTERNATIVES INCLUDE COSTS FOR ITEMS WHICH WERE EXCLUDED FROM ALTERNATIVE 6, BUT WHICH WOULD BE REQUIRED.

STATE ACCEPTANCE

ALTERNATIVES 7A, 7B, 7C WOULD RESULT IN CAPPING OR CONTAINMENT OF THE WASTE CKD THEREBY ADDRESSING THE STATE'S CONCERNS REGARDING CONTROL OF FUGITIVE DUST EMISSIONS, THE POTENTIAL FOR INGESTION OR DERMAL CONTACT WITH THE WASTE CKD, AND PROTECTION OF GROUND WATER.

ALTERNATIVE 6 WOULD RESULT IN CONTAINMENT OF THE MATERIAL, THEREBY ADDRESSING THE STATES CONCERNS REGARDING THE RISKS POSED BY THE SITE. THE WASTE CKD WOULD REMAIN ON-SITE UNDER THIS ALTERNATIVE WHICH WOULD LIMIT THE FUTURE LAND USE OF THE AREA.

ALTERNATIVES 13 AND 13A WOULD SATISFY THE STATE'S CONCERNS REGARDING THE RISKS POSED BY THE SITE AND WOULD LEAVE THE PROPERTY AVAILABLE FOR FUTURE USE. HOWEVER, IT WOULD BE NECESSARY TO ENSURE THAT THE BENEFICIAL REUSE DID NOT RESULT IN ADDITIONAL HEALTH PROBLEMS OR ENVIRONMENTAL DAMAGE.

ALTERNATIVES 5, 11 AND 12 ALSO INVOLVE REMEDIATION ON-SITE, WHICH WOULD LIMIT THE FUTURE LAND USE OF THE AREA. ALTERNATIVE 5 WOULD ADDRESS THE CONCERNS ABOUT BLOWING DUST AND DERMAL CONTACT, BUT DOES NOT INCLUDE A BOTTOM LINER AND CONSEQUENTLY DOES NOT PROTECT GROUND WATER ADEQUATELY.

ALTERNATIVES 11 AND 12 ARE UNPROVEN TECHNOLOGIES THAT MAY NOT REMEDIATE THE LONG-TERM RISKS ASSOCIATED WITH THE SITE.

COMMUNITY ACCEPTANCE

COMMUNITY ACCEPTANCE OF THE PREFERRED ALTERNATIVE IS EVALUATED AND DESCRIBED IN DETAIL IN THE RESPONSIVENESS SUMMARY OF THIS RECORD OF DECISION. IN SUMMARY, COMMUNITY COMMENTS HAVE BEEN MIXED. RESIDENTS NEAR THE PRESENT SITE HAVE STATED THEIR DESIRE TO HAVE THE WASTE CKD MOVED TO AN OFF-SITE DISPOSAL LOCATION. RESIDENTS OF MAGNA AND WEST VALLEY CITY OPPOSE THE STATE'S PREFERRED ALTERNATIVE, AND WOULD PREFER THAT THE WASTE CKD REMAIN AT THE PRESENT SITE OR BE MOVED TO ANOTHER OFF-SITE LOCATION. LONE STAR INDUSTRIES PREFERS THAT THE WASTE CKD BE CONSOLIDATED AND CAPPED ON SITE USING ALTERNATIVE 5. ONE OF THE LANDOWNERS, THE WILLIAMSEN INVESTMENT COMPANY, HAS INDICATED A PREFERENCE FOR THE STATE'S PREFERRED ALTERNATIVE.

#SR

9. THE SELECTED REMEDY

SELECTED REMEDY

BASED ON AN ANALYSIS OF THE NINE EVALUATION CRITERIA AS REQUIRED BY EPA GUIDANCE, THE SELECTED REMEDY FOR OPERABLE UNIT 1 IS ALTERNATIVE 7C - EXCAVATION AND DISPOSAL OFF-SITE IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL. THIS ALTERNATIVE INVOLVES THE EXCAVATION OF ALL WASTE CKD FROM THE SITE, AND ITS TRANSPORTATION TO AND DISPOSAL IN AN OFF-SITE, STATE APPROVED, DOUBLE-LINED, NONCOMMERCIAL, INDUSTRIAL WASTE LANDFILL TO BE CONSTRUCTED AT APPROXIMATELY 1300 SOUTH AND 7200 WEST, IN THE VICINITY OF THE EXISTING SALT LAKE VALLEY LANDFILL AND DEMOLITION AND INDUSTRIAL DISPOSAL FACILITIES IN SALT LAKE CITY, UTAH.

THE NEW LANDFILL FOR THE WASTE CKD MUST BE ACCEPTABLE TO THE STATE OF UTAH AND EPA, AND MUST MEET ALL PERMITTING REQUIREMENTS. ALL CHROMIUM-BEARING REFRACTORY KILN BRICK WILL BE REMOVED FROM THE WASTE CKD AND TEMPORARILY STORED AT AN ACCEPTABLE LOCATION PENDING TREATMENT AND DISPOSAL, WHICH WILL BE ADDRESSED UNDER A SUBSEQUENT OPERABLE UNIT(S) FOR THE SITE. EXCAVATED AREAS ON THE PRESENT SITE WILL BE RESTORED TO PRE-FILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIALS UNDER SUBSEQUENT OPERABLE UNIT(S). SOME CHANGES MAY BE MADE TO THE REMEDY AS A RESULT OF THE REMEDIAL DESIGN AND CONSTRUCTION PROCESS. SUCH CHANGES GENERALLY REFLECT MODIFICATIONS RESULTING FROM THE ENGINEERING DESIGN PROCESS. THE SELECTED REMEDY ALLOWS A MAXIMUM LEVEL OF FLEXIBILITY TO FURTHER OPTIMIZE THE REMEDIAL DESIGN WITH RESPECT TO THE REMEDIAL OBJECTIVES FOR OPERABLE UNIT 1 AND THE NEXT OPERABLE UNIT(S).

THE REMEDIATION GOALS OF THE SELECTED REMEDY INCLUDE:

- * REMOVAL OF THE SOURCE OF SOIL AND GROUND WATER CONTAMINATION,
- * REDUCTION IN THE LEVELS OF RISK ASSOCIATED WITH DIRECT CONTACT WITH WASTE CKD AND WITH EXPOSURE TO WINDBLOWN DUST FROM THE WASTE CKD,
- * COMPLIANCE WITH ALL CERCLA REQUIREMENTS AND ALL IDENTIFIED ARARS, INCLUDING THE UTAH CORRECTIVE ACTION CLEANUP STANDARDS RULE.

THE COST OF THE SELECTED REMEDY (\$12,518,143) IS INTERMEDIATE AND IS BELOW THE AVERAGE COST (\$12.8 MILLION) OF THE ALTERNATIVES PRESENTED IN THIS ROD, EXCLUDING THE "NO ACTION" ALTERNATIVE. THE MINIMUM COST OF THE ALTERNATIVES CONSIDERED (EXCLUDING ALTERNATIVE 1) IS \$7,800,000. THE MAXIMUM COST OF THE ALTERNATIVES CONSIDERED IS \$18,625,000. A DETAILED SUMMARY OF THE EXPECTED COSTS OF THE SELECTED REMEDY IS SHOWN

IN TABLE 9-1.

THE STATE OF UTAH HAS IDENTIFIED ALTERNATIVE 7C AS ITS PREFERRED ALTERNATIVE PRIMARILY BECAUSE OF ITS GREATER LONG-TERM EFFECTIVENESS AND PERMANENCE AND THE FACT THAT THE NEW LANDFILL UNDER THIS ALTERNATIVE WOULD BE LOCATED IN AN AREA THAT ALREADY CONTAINS INDUSTRIAL AND MUNICIPAL LANDFILLS, AND IS SOMEWHAT ISOLATED RELATIVE TO THE PRESENT SITE. THE PREFERRED ALTERNATIVE ALSO PROVIDES GREATER PROTECTION OF UTAH'S GROUND WATER RESOURCE AND BY REMOVING THE SOURCE OF THE SOIL AND GROUND WATER CONTAMINATION, ALLOWS UNOBSTRUCTIVE MONITORING OF THE GROUND WATER AT THE REDWOOD ROAD SITE. EPA HAS CHOSEN THE STATE OF UTAH'S PREFERRED ALTERNATIVE AS THE SELECTED REMEDY.

THE VOLUME OF WASTE CKD EXCAVATED WILL BE DETERMINED FROM THE WASTE CKD QUANTITY ESTIMATES IN COMBINATION WITH VISUAL AND CHEMICAL AND/OR PHYSICAL CHARACTERISTIC FIELD TESTS TO BE DETAILED DURING REMEDIAL NEGOTIATIONS AND DESIGN. THE FINAL CLEAN-UP LEVELS, WHICH WILL CONSIDER FOR FUTURE USES, WILL BE ADDRESSED IN THE FUTURE OPERABLE UNIT(S).

#SD

10. STATUTORY DETERMINATIONS FOR THE SELECTED REMEDY

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY WOULD REMOVE AND ISOLATE THE CONTAMINANT SOURCE FROM AN AREA OF RELATIVELY HIGH POPULATION THAT IS SUBJECT TO INCREASED URBANIZATION, THEREBY PROVIDING THE MAXIMUM REDUCTION OF THE RISKS OF DIRECT CONTACT AND BLOWING DUST, AND REMOVING THE SOURCE OF GROUND WATER CONTAMINATION. THE OFF-SITE LANDFILL FOR THE WASTE CKD WILL BE DESIGNED AND CONSTRUCTED TO HAVE AN IMPERVIOUS DOUBLE BOTTOM LINER AND LAYERED CAP THAT WOULD BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. THE AREA FOR THE NEW LANDFILL IS NEAR EXISTING INDUSTRIAL, DEMOLITION, AND MUNICIPAL LANDFILLS AND HAS BEEN DESIGNATED AS AN AREA SUITABLE FOR WASTE DISPOSAL LANDFILLS WITH AN APPROPRIATE ZONING EXCEPTION. THE NEW INDUSTRIAL LANDFILL WOULD ALSO PROVIDE THE HIGHEST DEGREE OF PROTECTION AVAILABLE FOR THE GROUNDWATER AND SURFACE WATER IN THE SITE AREA. THE SELECTED REMEDY IS CONSIDERED TO BE HIGHLY PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. THE IMPLEMENTATION OF THE REMEDY WILL NOT POSE UNACCEPTABLE SHORT-TERM RISKS. THE SELECTED REMEDY WILL FACILITATE THE FINAL REMEDIATION OF THE SITE THROUGH THE FUTURE OPERABLE UNIT(S).

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR'S)

THE PRIMARY REQUIREMENTS THAT ARE APPLICABLE OR RELEVANT AND APPROPRIATE TO THE SELECTED REMEDY ARE (1) STATE SOLID AND HAZARDOUS WASTE DISPOSAL REGULATIONS; (2) STATE HAZARDOUS WASTE STORAGE AND DISPOSAL REGULATIONS PERTAINING TO RCRA SUBTITLE C FACILITIES; (3) FEDERAL RCRA REGULATIONS PERTAINING TO THE LAND DISPOSAL RESTRICTIONS; AND (4) FEDERAL AND STATE AIR REGULATIONS ON TOTAL SUSPENDED PARTICULATES AND FUGITIVE DUST CONTROL. THE SELECTED REMEDY WOULD MEET ALL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF FEDERAL AND STATE ENVIRONMENTAL LAWS. A SUMMARY OF ARARS AND GUIDELINES TO BE CONSIDERED (TBCS) FOR THE SELECTED REMEDY IS PRESENTED IN TABLE 10-1.

COST EFFECTIVENESS

CERCLA SECTION 121 REQUIRES THAT THE SELECTED REMEDY AFFORD OVERALL EFFECTIVENESS PROPORTIONAL TO ITS COSTS. ACCORDING TO THE ESTIMATES PROVIDED BY LONE STAR INDUSTRIES, THE COST OF THE SELECTED REMEDY IS \$12,518,143. THIS COST WILL BE INTERMEDIATE WHEN COMPARED TO THE COSTS OF THE OTHER ALTERNATIVES, AND IS BELOW THE AVERAGE COST OF ALL THE ALTERNATIVES PRESENTED IN THIS ROD.

THERE IS NO ENTIRELY OBJECTIVE METHOD OF EVALUATING COST-EFFECTIVENESS BECAUSE THERE IS NO OBJECTIVE METHOD OF ASSIGNING A VALUE TO OVERALL EFFECTIVENESS. IN ADDITION, COSTS ASSOCIATED WITH INEFFECTIVENESS MAY

BE DIFFICULT TO QUANTIFY. THE COST OF THE SELECTED REMEDY IS SEEN TO BE RELATIVELY LOW WITH RESPECT TO THE COST OF EACH OF THE INDIVIDUAL ALTERNATIVES EVALUATED. THE SELECTED REMEDY PROVIDES THE GREATEST LONG-TERM EFFECTIVENESS AND OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OF ALL THE ALTERNATIVES EVALUATED. THEREFORE, THE SELECTED REMEDY APPEARS TO BE COST-EFFECTIVE.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT (OR RESOURCE RECOVERY) TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE (MEP)

THE SELECTED REMEDY WILL UTILIZE CONTAINMENT TO ADDRESS THE PRINCIPAL THREATS AT THE SITE. EXPOSURE TO WINDBLOWN DUST AND DIRECT CONTACT WITH WASTE CKD WILL BE ELIMINATED, BY REMOVING THE WASTE CKD FROM APPROXIMATELY 71 ACRES OF INDUSTRIAL (COMMERCIAL) LAND WHERE IT IS ALSO A SOURCE OF GROUND WATER CONTAMINATION. ALTHOUGH FOUR ALTERNATIVES, (ALTERNATIVES 11, 12, 13 AND 13A), INVOLVING TREATMENT AND/OR REUSE AS A RESOURCE WERE STUDIED IN DETAIL, THEY WERE NOT CONSIDERED TO BE VIABLE ALTERNATIVES FOR REMEDIATION OF THE SITE. FOR THE TWO ALTERNATIVES INVOLVING TREATMENT, (ALTERNATIVES 11 AND 12), THE PERMANENCE OF THE SOLIDIFIED WASTE CKD, ITS LONG-TERM PHYSICAL STABILITY, AND ITS ABILITY TO RESIST LEACHING WERE NOT DEMONSTRATED. FOR THE TWO ALTERNATIVES THAT PROPOSED REUSE OF THE WASTE CKD AS A RESOURCE, (ALTERNATIVES 13 AND 13A), LONE STAR INDUSTRIES WAS NOT ABLE TO IDENTIFY OR DEVELOP ANY MARKETS FOR THE WASTE CKD.

THE MOST DECISIVE FACTOR IN THE SELECTION DECISION WAS THE GOOD PERFORMANCE OF THE SELECTED REMEDY WHEN EVALUATED WITH RESPECT TO LONG-TERM EFFECTIVENESS AND PERMANENCE. WASTE CKD IS A HAZARDOUS SUBSTANCE UNDER CERCLA BECAUSE OF ITS ALKALINITY IN AN AQUEOUS ENVIRONMENT, AND THE TRACE METALS IT CONTAINS. IT IS ALSO VERY LONG-LIVED IN THE TYPE OF ENVIRONMENT THAT EXISTS AT THE SITE.

THE WASTE CKD IS CURRENTLY LOCATED IN AN AREA TARGETED FOR SIGNIFICANT FUTURE DEVELOPMENT WHICH WILL RESULT IN GREATER POPULATION EXPOSURE TO THE HAZARDS OF THE WASTE CKD. THE STATE OF UTAH AND THE LOCAL COMMUNITY HAVE EXPRESSED CONCERN THAT THE REMEDIAL ALTERNATIVE SELECTED PERMANENTLY ELIMINATE THE PATHWAYS OF EXPOSURE OF THE COMMUNITY TO THE WASTE CKD. TWO TREATMENT OPTIONS WERE EVALUATED THAT WOULD REDUCE THE MOBILITY OF THE WASTE CKD BY SOLIDIFICATION USING PORTLAND CEMENT OR FLY ASH AS SOLIDIFYING AGENTS. HOWEVER, THE LONG-TERM STABILITY AND EFFECTIVENESS OF THESE ALTERNATIVES IS NOT WELL DEMONSTRATED. THERE IS CONCERN THAT THE SOLIDIFIED WASTE CKD WOULD DETERIORATE UNDER CONDITIONS OF EXTREME PH, AND CONTINUE TO BE A SOURCE OF CONTAMINATION OF GROUND WATER THROUGH LEACHING IN THE LONG-TERM. THE SOLIDIFICATION ALTERNATIVES WERE HIGHER IN COST THAN MOST OTHER ALTERNATIVES.

DISPOSAL IN A DOUBLE-LINED INDUSTRIAL LANDFILL WOULD NOT REDUCE TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT, BUT WOULD ISOLATE THE WASTE CKD FROM THE POTENTIALLY EXPOSED POPULATION AND THE ENVIRONMENT. ALTHOUGH THE PHYSICAL REMOVAL OF THE CHROMIUM-BEARING REFRACTORY KILN BRICK (WHICH IS A HAZARDOUS WASTE) FROM THE WASTE CKD DOES NOT STRICTLY MEET THE DEFINITION OF TREATMENT IN THE NEW NATIONAL CONTINGENCY PLAN, THE REMOVAL OF THAT BRICK WILL SIGNIFICANTLY REDUCE THE CONCENTRATION AND/OR POTENTIAL FOR LEACHING OF CHROMIUM FROM THE BRICK INTO THE WASTE CKD. ADDITIONALLY, SUBSEQUENT OPERABLE UNIT(S) FOR THE SITE WILL ADDRESS TREATMENT AND DISPOSAL OF THE CHROMIUM BRICKS.

ONE OF THE MOST IMPORTANT LONG-TERM ADVANTAGES OF THE SELECTED REMEDY IS THE RELATIVELY LOW IMPACT AT A RELATIVELY ISOLATED DISPOSAL SITE FOR MAINTENANCE AND REPAIR ACTIVITIES TO THE LANDFILL STRUCTURE. ON-SITE MAINTENANCE AND REPAIR MAY BE MADE INCREASINGLY DIFFICULT AS THE SITE AREA BECOMES MORE HIGHLY DEVELOPED. REPLACEMENT OF A LINER WOULD BE SIGNIFICANTLY MORE DIFFICULT TO ACCOMPLISH AND WOULD INVOLVE GREATER RISK TO THE SURROUNDING COMMUNITY IN A DEVELOPED URBAN SETTING THAN THE DISPOSAL AREA OF THE SELECTED REMEDY.

#DSC

11. DOCUMENTATION OF SIGNIFICANT CHANGES

SINCE THE REVISED PROPOSED PLAN, THE RCRA RULE, "LAND DISPOSAL RESTRICTIONS FOR THE THIRD SCHEDULE OF HAZARDOUS WASTE," WAS PROMULGATED. LAND DISPOSAL OF CHROMIUM HAZARDOUS WASTE ABOVE THE SPECIFIED TREATMENT LEVEL IS PROHIBITED. THUS, THIS RULE REQUIRES THE TREATMENT OF THE CHROMIUM BRICKS PRIOR TO LAND DISPOSAL. EXCEPT FOR THE "NO ACTION" ALTERNATIVE, THE ALTERNATIVES DESCRIBED IN THE REVISED PROPOSED PLAN REQUIRED THE SEPARATION AND DISPOSAL OF THE BRICKS AT A RCRA SUBTITLE C FACILITY. HOWEVER, DUE TO THE TREATMENT REQUIREMENT, THE CHROMIUM BRICKS WILL BE SEPARATED AND TEMPORARILY STORED UNDER THIS OPERABLE UNIT. TREATMENT AND DISPOSAL OF THE CHROMIUM BRICKS WILL BE ADDRESSED IN THE SUBSEQUENT OPERABLE UNIT(S).

THE METHOD AND EFFECTIVENESS OF THE CHROMIUM BRICK TREATMENT, IS DEPENDENT UPON THE CONCENTRATION OF CHROMIUM AND OTHER CONSTITUENTS IN THE BRICKS. THUS, A TREATABILITY STUDY NEEDS TO BE CONDUCTED BEFORE THE TREATMENT AND DISPOSAL OF THE BRICKS IS ADDRESSED IN THE SUBSEQUENT OPERABLE UNIT(S). AS PREVIOUSLY STATED, THE CHROMIUM BRICKS WILL NOT BE TRANSPORTED AND DISPOSED AT A RCRA SUBTITLE C FACILITY UNDER THIS OPERABLE UNIT, BUT WILL BE ADDRESSED IN A SUBSEQUENT OPERABLE UNIT(S). THE COST DIFFERENCES RESULTING FROM THIS CHANGE, HAVE BEEN EXPLAINED IN CHAPTERS 7 AND 8.

THE PREFERRED ALTERNATIVE DESCRIBED IN THE REVISED PROPOSED PLAN INCLUDED A CONTINGENCY REMEDY. THE CONTINGENCY REMEDY IS NOT A PART OF THIS RECORD OF DECISION, BECAUSE THE SELECTED REMEDY IS IMPLEMENTABLE.

LASTLY, SINCE THIS REMEDIAL ACTION FOR OPERABLE UNIT 1, IS NOT THE FINAL REMEDIAL ACTION FOR THE SITE, THE EXCAVATED AREAS OF THE SITE WILL NOT BE FILLED AND GRADED. SUBSEQUENT OPERABLE UNIT(S) WILL ADDRESS ANY REMAINING CONTAMINATION AND RECLAMATION AT THE SITE.

RESPONSIVENESS SUMMARY

PORTLAND CEMENT CO. (KILN DUST #2 & #3)
SALT LAKE CITY, UTAH
RESPONSIVENESS SUMMARY

OVERVIEW: THERE HAS BEEN CONSIDERABLE COMMUNITY INTEREST AND PARTICIPATION IN PUBLIC MEETINGS FOR THE RI/FS AND THE INITIAL AND REVISED PROPOSED PLANS FOR THIS SITE. THE PRPS HAVE ALSO BEEN ACTIVE PARTICIPANTS IN THE COMMUNITY RELATIONS PROCESS. COMMUNITY INVOLVEMENT MAY BE HIGH, IN PART, BECAUSE THIS AND ANOTHER LOCAL SUPERFUND SITE (SHARON STEEL) HAVE RECEIVED SIGNIFICANT MEDIA ATTENTION. SIMILAR ISSUES ARE INVOLVED AT BOTH SITES. RECENT COMMUNITY RELATIONS ACTIVITIES FOR THIS SITE ARE SUMMARIZED IN AN ATTACHMENT TO THIS ROD.

THE PREFERRED ALTERNATIVE FOR OPERABLE UNIT 1 IS ALTERNATIVE 7C-EXCAVATION AND DISPOSAL OFF-SITE IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL. THIS ALTERNATIVE INVOLVES THE EXCAVATION OF ALL WASTE CKD FROM THE SITE, AND ITS TRANSPORTATION TO AND DISPOSAL IN AN OFF-SITE, STATE APPROVED, NON-COMMERCIAL, DOUBLE-LINED, NONHAZARDOUS INDUSTRIAL LANDFILL TO BE CONSTRUCTED IN THE VICINITY OF THE EXISTING SALT LAKE VALLEY LANDFILL AT APPROXIMATELY 1300 SOUTH AND 7200 WEST IN SALT LAKE CITY, UTAH. ALL CHROMIUM-BEARING REFRACTORY KILN BRICK WILL BE REMOVED FROM THE WASTE CKD AND TEMPORARILY STORED ON-SITE. TREATMENT AND DISPOSAL OF THE BRICKS WILL BE ADDRESSED IN A SUBSEQUENT OPERABLE UNIT. EXCAVATED AREAS ON THE PRESENT SITE WILL BE RESTORED TO PREFILLED CONTOURS THROUGH THE PLACEMENT OF BANKRUN FILL MATERIALS DURING A SUBSEQUENT OPERABLE UNIT(S).

TWO DIFFERENT PROPOSED PLANS WERE RELEASED FOR THIS SITE. THE INITIAL PROPOSED PLAN, RELEASED ON OCTOBER 16, 1989, IDENTIFIED OFF-SITE REMOVAL OF WASTE CKD AS ITS PREFERRED ALTERNATIVE. OFF-SITE REMOVAL OF WASTE CKD WOULD HAVE BEEN ACCOMPLISHED USING EITHER OR A COMBINATION OF THE FOLLOWING TWO METHODS: (1) DISPOSAL, WITH OR WITHOUT TREATMENT, AT AN OFF-SITE LOCATION THAT IS ACCEPTABLE TO THE STATE OF UTAH AND EPA, AND/OR (2) REUSE AS A RESOURCE. THE PUBLIC COMMENT PERIOD ON THIS PLAN WAS FROM OCTOBER 16, 1989 THROUGH NOVEMBER 6, 1989.

BECAUSE THE INITIAL PROPOSED PLAN DID NOT IDENTIFY A SPECIFIC AREA OR SITE FOR OFF-SITE DISPOSAL OF WASTE CKD, THE STATE OF UTAH DEVELOPED A SECOND PROPOSED PLAN KNOWN AS THE REVISED PROPOSED PLAN, WHICH WAS RELEASED ON MARCH 26, 1990. THE "REUSE AS A RESOURCE" OPTION IN THE INITIAL PROPOSED PLAN HAS BEEN DELETED FROM THE REVISED PROPOSED PLAN BECAUSE LONE STAR WAS UNABLE TO IDENTIFY ANY VIABLE OPTIONS FOR THE WASTE CKD. THE 60-DAY PUBLIC COMMENT PERIOD ON THIS PLAN (WHICH INCLUDED A 30-DAY EXTENSION TO THE PUBLIC COMMENT PERIOD GRANTED BY EPA) ENDED ON MAY 26, 1990. THE REVISED PROPOSED PLAN IDENTIFIED ALTERNATIVE 7C, EXCAVATION AND DISPOSAL OFF-SITE IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL, AS ITS PREFERRED ALTERNATIVE. IT ALSO IDENTIFIED A CONTINGENCY ALTERNATIVE (ALTERNATIVE 6-EXCAVATION AND DISPOSAL ON-SITE) WHICH WOULD BE IMPLEMENTED FOR THE SITE IN THE EVENT THE STATE OF UTAH AND EPA DETERMINED THAT THE STATE OF UTAH'S PREFERRED ALTERNATIVE CANNOT BE IMPLEMENTED. THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) BECAME THE SELECTED REMEDY IN THIS RECORD OF DECISION.

CITIZEN AWARENESS AND CONCERN REGARDING THIS SITE HAS STRONGLY INFLUENCED THE GOVERNMENT'S DECISION TO RECOMMEND A REMEDY THAT WOULD REMOVE THE WASTE CKD FROM THE SITE. THE LOCAL COMMUNITY STRONGLY SUPPORTED THE PREFERRED ALTERNATIVE IN THE INITIAL PLAN. THE COMMUNITY RESPONSE FOR THE PREFERRED ALTERNATIVE AND THE CONTINGENCY ALTERNATIVE IN THE REVISED PROPOSED PLAN REFLECTED A MIXED REACTION. LONE STAR INDUSTRIES FAVORED IMPLEMENTATION OF ALTERNATIVE 5 - CONSOLIDATION OF WASTE CKD ON THE WEST SITE. ONE OR THE TWO PRINCIPAL OWNERS OF THE PRESENT SITE EXPRESSED SUPPORT FOR THE PREFERRED ALTERNATIVE, BUT NOT FOR THE CONTINGENCY ALTERNATIVE. MAYOR PALMER DEPAULIS OF SALT LAKE CITY OBJECTED TO THE CONTINGENCY ALTERNATIVE (ALTERNATIVE 6 - EXCAVATION

AND DISPOSAL ON-SITE) AND TO ALTERNATIVE 5 INVOLVING THE CONSOLIDATION AND ENCAPSULATION OF WASTE CKD ON THE PRESENT SITE, BUT RELUCTANTLY AGREED TO THE IMPLEMENTATION OF THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) IF OTHER ISOLATED OFF-SITE DISPOSAL AREAS ARE NOT POSSIBLE. RESIDENTS NEAR THE PRESENT SITE FAVORED THE PREFERRED ALTERNATIVE. RESIDENTS OF TWO COMMUNITIES (MAGNA AND WEST VALLEY CITY) NEAREST THE NEW LANDFILL SITE DESCRIBED IN THE PREFERRED ALTERNATIVE OBJECT TO THE PREFERRED ALTERNATIVE, PRIMARILY BECAUSE OF CONCERNS (1) REGARDING FUGITIVE DUST FROM THE CONSTRUCTION OF THE NEW LANDFILL, (2) POSSIBLE CONTAMINATION OF GROUND WATER, AND (3) INTERFERENCE WITH THE FUTURE CONSTRUCTION OF 7200 WEST STREET.

BACKGROUND ON COMMUNITY INVOLVEMENT

MANY OF THE MEMBERS OF THE COMMUNITY MOST ACTIVE IN ORGANIZING PUBLIC AWARENESS OF THE SITE HAVE LIVED OR WORKED IN THE AREA FOR MANY YEARS. COMMUNITY INTEREST IN WASTE CKD DATES TO THE 1950'S, WHEN THE PORTLAND CEMENT COMPANY PLANT DID NOT CONTROL AIR EMISSION OF CKD FROM ITS CEMENT PRODUCTION PLANT. WASTE CKD DEPOSITION WAS REPORTEDLY HEAVY IN THE WASTE VICINITY OF THE PLANT LOCATED IN SALT LAKE CITY, BUT WAS CONSIDERED TO BE PRIMARILY A NUISANCE. OWNERS OF THE PRESENT SITE ACCEPTED THE WASTE CKD AS FILL MATERIAL UNTIL THE END OF 1983. UNTIL THE SITE WAS PROPOSED FOR THE NATIONAL PRIORITIES LIST IN 1984, THERE WAS LITTLE PUBLIC AWARENESS OF THE POTENTIAL HEALTH HAZARD OF THE DUST. GENERAL PUBLIC AWARENESS IN ENVIRONMENTAL HAZARDS HAS INCREASED RECENTLY, WITH SOME OF THIS AWARENESS TRANSLATING INTO RELUCTANCE TO LOCATE A BUSINESS OR INDUSTRY NEAR A CURRENT OR FORMER WASTE SITE. A NUMBER OF PUBLIC COMMENTERS LIVING NEAR THE PRESENT SITE IDENTIFIED LOST PROPERTY VALUES, LOST TAX BASE, OR LOST DEVELOPMENT OPPORTUNITY AS CONTRIBUTING TO THEIR PREFERENCE FOR A REMEDIAL ALTERNATIVE THAT REMOVES THE WASTE CKD FROM THE AREA.

DURING THE PUBLIC COMMENT PERIOD FOR THE RI/FS, THE GOVERNMENT RECEIVED COMMENTS FOCUSING ON THE HEALTH EFFECTS OF THE WASTE CKD, THE NEED TO REMOVE THE WASTE CKD FROM THE SITE AREA, AND THE NEED TO PREVENT THE CONTAMINATION OF GROUND WATER.

PRIOR TO AND DURING THE PUBLIC COMMENT PERIOD FOR THE REVISED PROPOSED PLAN, SALT LAKE CITY OFFICIALS, PARTICULARLY MAYOR PALMER DEPAULIS' OFFICE, SHOWED CONSIDERABLE ATTENTION TO THIS PROJECT AND WERE INVOLVED IN A NUMBER OF DISCUSSIONS WITH THE STATE OF UTAH INVOLVING POSSIBLE REMEDIAL ACTIONS FOR THE SITE.

SUMMARY OF PUBLIC COMMENTS AND THE STATE OF UTAH'S RESPONSE

COMMENTS PRESENTED DURING THE PORTLAND CEMENT CO (KILN DUST #2 & #3) PUBLIC COMMENT PERIODS ON THE INITIAL AND REVISED PROPOSED PLANS ARE SUMMARIZED BRIEFLY BELOW. THE PUBLIC COMMENT PERIOD FROM THE INITIAL PROPOSED PLAN WAS HELD FROM OCTOBER 16, 1989 THROUGH NOVEMBER 6, 1989 AND THE PUBLIC COMMENT PERIOD FOR THE REVISED PROPOSED PLAN WAS HELD FROM MARCH 26, 1990 THROUGH MAY 26, 1990. THE COMMENTS ARE CATEGORIZED BY RELEVANT TOPICS.

COMMENTERS WERE GENERALLY DIVIDED BETWEEN (1) THOSE WHO PREFERRED REMOVAL OF THE WASTE CKD FROM THE SITE FOLLOWED, BY OFF-SITE DISPOSAL IN AN ISOLATED, OFF-SITE LOCATION, AND (2) THOSE WHO PREFERRED CONSTRUCTION OF AN ON-SITE DISPOSAL FACILITY. LONE STAR INDUSTRIES AND ITS REPRESENTATIVES PREFERRED ON-SITE DISPOSAL AND QUESTIONED THE IMPLEMENTABILITY AND COST EFFECTIVENESS OF THE PREFERRED ALTERNATIVE. LONE STAR INDUSTRIES ALSO QUESTIONED THE ADEQUACY OF THE GOVERNMENT'S COMPLIANCE WITH CERCLA IN THE SELECTION OF THE PREFERRED ALTERNATIVE AND CONTINGENCY ALTERNATIVE FOR THE SITE.

SUMMARY OF PUBLIC COMMENTS RECEIVED FOR THE INITIAL PROPOSED PLAN AND GOVERNMENT'S RESPONSE.

SELECTION OF REMEDY PROCESS UNDER CERCLA

1. LONE STAR INDUSTRIES, THROUGH ITS REPRESENTATIVES (INCLUDING PSM INTERNATIONAL, INC.; DAMES AND MOORE; AND PILLSBURY, MADISON AND SUTRO), COMMENTED THAT CERCLA REQUIRES THAT THE PREFERRED ALTERNATIVE BE ONE OF THE ALTERNATIVES EVALUATED IN THE RI/FS, AND THAT THE STATE'S PREFERRED ALTERNATIVE WAS NOT EVALUATED IN THE RI/FS.

RESPONSE: THE EPA'S INTERIM FINAL GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS INDICATES THAT THE ALTERNATIVES DEVELOPED, SCREENED, AND ANALYZED IN THE FEASIBILITY STUDY CONSTITUTE THE BASIS FOR THE SELECTION OF THE RESPONSE ACTION. HOWEVER, THERE IS NO REQUIREMENT THAT THE PREFERRED ALTERNATIVE BE ONE OF THE ALTERNATIVES DESCRIBED IN THE FS. THE GOVERNMENT BELIEVES THAT ADEQUATE INFORMATION HAS BEEN GENERATED DURING THE RI/FS TO FORM THE BASIS FOR SELECTING THE PREFERRED ALTERNATIVE, A HYBRID OF THE ALTERNATIVES PRESENTED IN THE FS, AND EVALUATED IN AN ADDENDUM TO THE FS. THE INITIAL PROPOSED PLAN IS A PUBLIC PARTICIPATION DOCUMENT WHICH ENABLES THE STATE AND THE EPA TO EVALUATE COMMUNITY ACCEPTANCE OF THE PREFERRED ALTERNATIVE, AND TO MODIFY THE PREFERRED ALTERNATIVE, IF NECESSARY, BEFORE SELECTING A REMEDY IN THE ROD. AT THE TIME OF THE ISSUANCE OF THE INITIAL PROPOSED PLAN, THE COMMUNITY, INCLUDING ELECTED REPRESENTATIVES AND AGENCY OFFICIALS, ALMOST UNANIMOUSLY INDICATED A PREFERENCE FOR THE PREFERRED ALTERNATIVE. WITH THE ISSUANCE OF THE REVISED PROPOSED PLAN, COMMUNITY AND ELECTED REPRESENTATIVES REMAIN COMMITTED TO MOVING THE WASTE CKD OFF-SITE BUT THERE IS OPPOSITION FROM THE COMMUNITY OF MAGNA AND WEST VALLEY CITY (THE COMMUNITIES NEAREST THE OFFSITE DISPOSAL SITE) AND ELECTED REPRESENTATIVES TO THE OFFSITE LOCATION.

2. CLEAN SITES, A NON-PROFIT ORGANIZATION RETAINED BY LONE STAR INDUSTRIES, INC. TO PERFORM A REVIEW OF THE INITIAL PROPOSED PLAN, ASKED WHEN THE REMEDY (OFF-SITE LOCATION FOR DISPOSAL OF THE WASTE CKD) WOULD BE BETTER DEFINED.

RESPONSE: THE OFF-SITE LOCATION HAS BEEN SPECIFIED IN THE REVISED PROPOSED PLAN. THE PREFERRED ALTERNATIVE INCLUDES COMPONENTS THAT WILL REQUIRE FURTHER DESIGN TO ENSURE THEIR IMPLEMENTABILITY BUT SUCH AN EVALUATION WILL OCCUR DURING THE REMEDIAL DESIGN PHASE.

REMEDIAL ACTION PREFERENCES

3. LONE STAR INDUSTRIES AND THEIR REPRESENTATIVES PREFERRED ON-SITE DISPOSAL ALTERNATIVES 5 AND 6. THEY FELT THAT ALTERNATIVE 5 WAS THE MOST COST-EFFECTIVE ALTERNATIVE AND THAT BOTH ALTERNATIVES 5 AND 6 PERFORMED AS WELL AS ALTERNATIVE 7 AGAINST THE EPA'S BALANCING CRITERIA.

RESPONSE: THE GOVERNMENT CONSIDERED THE TRADE-OFFS BETWEEN THE ALTERNATIVES AND DECIDED THAT OFF-SITE DISPOSAL IS THE MOST PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, BEST FULFILLS THE STATUTORY PREFERENCE THAT TREATMENT OF THE WASTE BE USED TO THE EXTENT PRACTICABLE, AND IS COST EFFECTIVE. COST-EFFECTIVE, AS DESCRIBED IN THE ROD, DOES NOT MEAN LEAST COST. TWO MAJOR ADVANTAGES OF OFF-SITE DISPOSAL JUSTIFY ADDITIONAL COST. THE FIRST IS THAT IT WOULD MOVE THE WASTE AWAY FROM A MORE URBAN TO A LESS URBAN ENVIRONMENT. THE LOCATION OF THE DISPOSAL FACILITY IS IMPORTANT SINCE UNCERTAINTIES IN THE EFFECTIVENESS OF ANY ENGINEERING DESIGN INCREASE WITH TIME, AND MAINTENANCE OF THE DISPOSAL FACILITY CAN BE MORE EASILY ACCOMPLISHED. THE SECOND ADVANTAGE IS THAT REMEDIATION AND FUTURE PROTECTION OF GROUND WATER, WHICH WILL BE ADDRESSED IN SUBSEQUENT OPERABLE UNIT(S) CAN BE BETTER ACCOMPLISHED IF THE WASTE CKD IS REMOVED FROM THE SITE.

SINCE ISSUING THE INITIAL PROPOSED PLAN, THE STATE OF UTAH HAS DISCOVERED THAT THE ESTIMATED COSTS PRESENTED IN THE FS FOR ALTERNATIVE CKD/5 WERE INCORRECT DUE TO COMPUTATIONAL ERRORS MADE BY LONE STAR. THOSE INCORRECT COSTS, WHICH WERE SUBSTANTIALLY LOWER THAN THE ACTUAL ESTIMATED COSTS, SHOWED A PRESENT VALUE COST OF \$6.01 MILLION, A CAPITAL COST OF \$6.14 MILLION, AND ANNUAL OPERATION AND MAINTENANCE COST OF

\$6,000 FOR A 30-YEAR PERIOD. CORRECTED COSTS FOR ALTERNATIVE CKD/5 PROVIDED BY LONE STAR INDUSTRIES SHOW A PRESENT VALUE COST OF \$8.39 MILLION, A CAPITAL COST OF \$9.14 MILLION, AND ANNUAL OPERATION AND MAINTENANCE COSTS OF \$5,000 FOR A 30-YEAR PERIOD.

FINALLY, AS DISCUSSED ABOVE, COMMUNITY ACCEPTANCE OF EITHER OF THE TWO CONTAINMENT ALTERNATIVES IS VERY LOW. THE GOVERNMENT CANNOT IGNORE THE GREAT PREPONDERANCE OF SUPPORT FOR AN OFF-SITE DISPOSAL REMEDY THAT HAS BEEN EXPRESSED BY THE COMMUNITY.

TECHNICAL CONCERNS/QUESTIONS REGARDING REMEDIAL ALTERNATIVES

4. MARK SCHULTHEIS OF DAMES AND MOORE, SPEAKING AS A CONSULTANT FOR LONE STAR INDUSTRIES, COMMENTED THAT TRANSPORTING THE WASTE A DISTANCE OF 40 MILES TO THE TOOELE COUNTY SITE WOULD INCREASE THE AMOUNT OF DUST, AND INCREASE THE INCIDENCE OF TRAFFIC ACCIDENTS. HE ALSO COMMENTED THAT THE QUARRY IS NOT PERMITTED TO RECEIVE ADDITIONAL WASTE CKD.

RESPONSE: THE GOVERNMENT INTENDS TO CAREFULLY MONITOR THE REMOVAL AND TRANSPORT ACTIVITIES TO ENSURE THAT THE PUBLIC IS ADEQUATELY PROTECTED DURING THE IMPLEMENTATION PERIOD. THIS MAY INCLUDE IMPLEMENTING METHODS OF REDUCING TRAFFIC-RELATED RISKS. DURING THE REMEDIAL DESIGN PROCESS, THE STATE AND LOCAL AGENCIES WILL WORK TOGETHER TO ENSURE THAT ADEQUATE PROTECTIVE FEATURES ARE BUILT INTO THE DISPOSAL SITE DESIGN. THE GOVERNMENT FULLY INTENDS TO TAKE INTO ACCOUNT CONCERNS OF THE COMMUNITY WHERE THE DISPOSAL SITE IS LOCATED.

5. MR. MATT TRUJILLO, REPRESENTING THE TOOELE COUNTY HEALTH DEPARTMENT, SAID THAT HE STRONGLY OPPOSED ALTERNATIVE 7 OF THE FEASIBILITY STUDY, WHICH IS IDENTIFIED IN THE INITIAL PROPOSED PLAN AS AN EXAMPLE OF THE TYPE OF OFF-SITE DISPOSAL OPTION PREFERRED BY THE STATE. HE COMMENTED THAT THE ON-SITE DISPOSAL OF THE 360 TONS OF CHROMIUM WOULD BE DETRIMENTAL TO THE HEALTH OF TOOELE COUNTY RESIDENTS, AND EXPRESSED THE TOOELE COUNTY HEALTH DEPARTMENT'S CONCERNS ABOUT GROUND WATER AND AIR CONTAMINATION AT THE QUARRY #3 SITE. FINALLY HE INDICATED THAT THE COUNTY FEELS THAT THERE ARE EXISTING FACILITIES THAT COULD ACCEPT WASTE CKD.

RESPONSE: THE GOVERNMENT INTENDS TO CONSIDER THE CONCERNS OF THE LOCAL COMMUNITY IN THE DESIGN AND LOCATION OF THE DISPOSAL FACILITY.

THE 360 TONS OF REFRACTORY KILN BRICKS, WHICH CONTAIN CHROMIUM AND ARE HAZARDOUS WASTE WILL BE SEPARATED AND TREATED PRIOR TO DISPOSAL. EACH OF THE ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY, EXCEPT THE "NO ACTION" ALTERNATIVE, INCLUDE THE SAME DISPOSAL REQUIREMENT FOR THE CHROMIUM-BEARING REFRACTORY KILN BRICK.

7. ONE OF THE PROPERTY OWNERS NEAR THE SITE, MR. GEORGE DAWSON, SUGGESTED LEVELING THE MOUNDS OF WASTE CKD AROUND THE PERIMETER OF THE SITE AND TREATING THE WASTE CKD WITH A STABILIZER TO PREVENT BLOWING DUST DURING PERIODS OF HIGH WINDS.

RESPONSE: THE STATE REQUESTED THAT LONE STAR CONSTRUCT A FENCE AROUND THE PERIMETER OF THE SITE TO PREVENT TRESPASSERS FROM ENTERING THE SITE AND COMING INTO DIRECT CONTACT WITH THE WASTE CKD. IN ORDER TO CONSTRUCT THE FENCE, EARTHMOVING EQUIPMENT WAS USED TO MOVE SOME OF THE WASTE CKD WITHIN THE SITE PERIMETER. THIS RESULTED IN ADDITIONAL MOUNDING OF THE WASTE CKD AND SOIL INSIDE THE PERIMETER FENCE. THE FENCING PLAN FOR THE SITE AGREED TO BY LONE STAR INDUSTRIES STATES THAT; "ANY CONTAMINATED SOIL THAT IS REMOVED FOR DIKE CONSTRUCTION WILL BE PLACED INSIDE THE DIKE AREAS IN A STABLE CONFIGURATION. ALL DISTURBED OR NEWLY CREATED SLOPES WILL ALSO BE LEFT IN A STABLE CONFIGURATION". THE STATE BUREAU OF AIR QUALITY HAS ALSO BEEN MONITORING THE APPLICATION OF A DUST STABILIZER TO REDUCE DUST EMISSIONS. TO BE EFFECTIVE, THE WASTE CKD MUST BE TREATED WITH THE STABILIZER AT FREQUENT INTERVALS. THE GOVERNMENT WILL INVESTIGATE THE PROBLEM AND MAY RECOMMEND ADDITIONAL ACTION.

8. MR. GEORGE DAWSON ALSO RAISED SEVERAL ISSUES REGARDING THE SITE AND CLEANUP: (1) HE SUGGESTED THAT SOME SORT OF HEALTH TESTING OF RESIDENTS SHOULD BE INITIATED, (2) HE ASKED WHAT THE SHORT AND LONG-TERM EFFECTS OF THE SITE ON GROUND WATER WOULD BE, (3) HE ASKED ABOUT THE COST TO TAXPAYERS, (4) HE ASKED WHO IS RESPONSIBLE FOR THE CLEANUP OF BORDERING PROPERTIES CONTAMINATED BY THE WASTE CKD.

RESPONSE:

(1) NO HEALTH TESTING IS PROPOSED UNDER ANY OF THE ALTERNATIVES IDENTIFIED FOR THE SITE. AIR MONITORING WILL BE CONDUCTED DURING THE IMPLEMENTATION OF THE REMEDIAL ACTION TO ENSURE THAT PARTICULATE LEVELS ARE KEPT WITHIN STATE AND FEDERAL STANDARDS, AND PROTECTIVE MEASURES WILL BE IMPLEMENTED TO MINIMIZE THE POTENTIAL HEALTH RISKS TO THE PUBLIC DURING THE CLEANUP.

(2) REMEDIATION OF THE WASTE CKD AT THE SITE WILL ELIMINATE THE SOURCE OF SOIL AND GROUND WATER CONTAMINATION AND WILL ENABLE THE REMEDIATION OF SAME. GROUNDWATER WILL BE ADDRESSED WITH A SEPARATE REMEDY IN A SELECTION PROCESS LIKE THE ONE USED TO SELECT A REMEDY FOR THE WASTE CKD. MEANWHILE, THE GROUND WATER AT THE SITE IS BEING MONITORED AND THE RESULTS OF THIS STUDY WILL HELP TO FORM THE BASIS FOR A SET OF RECOMMENDATIONS ON HOW BEST TO REMEDIATE THE GROUND WATER.

(3) THE COST OF THE CLEANUP OF THE SITE IS PAID BY THE PARTIES FOUND TO BE LEGALLY RESPONSIBLE FOR IT. UNDER THE SUPERFUND LAW, TAX MONEY IS NOT USED TO COVER THE COST OF INVESTIGATION OR FOR CLEANUP OF SITES, UNLESS THE PRPS REFUSES TO UNDERTAKE THE REMEDIAL ACTION DESCRIBED IN THE ROD FOR THE SITE. IN THAT CIRCUMSTANCE, EPA COULD ORDER THE PRPS TO UNDERTAKE THE CLEANUP AT THE SITE OR UNDERTAKE THE DESIGNATED REMEDIAL ACTION FOR THE SITE WITH SUPERFUND MONIES, THEN SEEK TO RECOVER THOSE COSTS FROM THE PRPS THROUGH COURT ACTION AFTER THE CLEANUP.

(4) ALL OF THE WASTE CKD THAT IS IDENTIFIED AT THE SITE WILL BE EXCAVATED AND REMOVED UNDER THE PREFERRED ALTERNATIVE. IT IS DIFFICULT TO IDENTIFY SMALL AMOUNTS OF CKD THAT HAVE BEEN MIXED WITH SOIL. THE EXTENT OF WASTE CKD CONTAMINATION IS DISCUSSED IN DETAIL IN THE REMEDIAL INVESTIGATION REPORT.

9. ONE OF THE COMMENTERS, REPRESENTING A PROPERTY OWNER ADJACENT TO THE SITE WHOSE PROPERTY IS AFFECTED BY THE WASTE CKD, EXPRESSED A CONCERN ABOUT HOW THE RESTORATION OF THE SITE WOULD BE ACCOMPLISHED, INDICATING THAT THE WASTE CKD HAD CAUSED WATER TO POND BEHIND HIS PROPERTY.

RESPONSE: FOLLOWING REMOVAL OF THE WASTE CKD, THE SITE WILL BE FILLED WITH CLEAN BANKRUN FILL, GRADED, COMPACTED AND RESTORED TO ITS ORIGINAL CONTOURS. THE DRAINAGE OF THE SOIL WILL BE VASTLY IMPROVED BECAUSE THE PERMEABILITY OF NORMAL SOIL IS MUCH GREATER THAN THE PERMEABILITY OF WASTE CKD.

10. A COMMENTER SUGGESTED THAT THE WASTE CKD BE REMOVED TO THE WEST DESERT BY RAILROAD.

RESPONSE: THE USE OF RAILROAD CARS TO TRANSPORT THE WASTE OFF-SITE WAS INVESTIGATED IN THE FEASIBILITY STUDY AND FOUND TO BE MORE EXPENSIVE THAN TRANSPORT BY TRUCK. THIS WAS BECAUSE LOADING AND UNLOADING OF RAIL CARS WOULD REQUIRE ADDITIONAL HANDLING OF THE WASTE. THE PROXIMITY OF A RAIL LINE TO AN EXISTING OR POTENTIAL DISPOSAL SITE IS THEREFORE A CRITICAL FACTOR.

SUMMARY OF PUBLIC COMMENTS RECEIVED FOR THE REVISED PROPOSED PLAN AND THE GOVERNMENT'S RESPONSE

SELECTION OF REMEDY PROCESS UNDER CERCLA

1. LONE STAR'S REPRESENTATIVE, MALLORY MAY OF PSM INTERNATIONAL, COMMENTED THAT 40 CFR 300.68(H) REQUIRES THE LEAD AGENCY TO CHOOSE ONE REMEDY FOR CLEANING UP THIS SITE, BUT IN FACT THE STATE SELECTED TWO

REMEDIES FOR THAT PURPOSE.

RESPONSE: IN THE REVISED PROPOSED PLAN, THE GOVERNMENT IDENTIFIED BOTH A SELECTED REMEDY AND A CONTINGENCY REMEDY FOR THIS SITE. THE CONTINGENCY REMEDY WOULD BE IMPLEMENTED FOR THE SITE ONLY IF THE STATE OF UTAH AND EPA DETERMINE THAT THE SELECTED REMEDY CANNOT BE IMPLEMENTED. EPA GUIDANCE ON PREPARING PROPOSED PLANS AND RODS (INTERIM FINAL GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS, JULY 1989, PAGES 9-15 THROUGH 9-21) CLEARLY INDICATES THAT CONTINGENCY REMEDIES MAY BE IDENTIFIED IN THOSE DOCUMENTS.

IN ANY EVENT, THE RECORD OF DECISION DESIGNATING THE SELECTED REMEDY HAS DELETED THIS CONTINGENCY ALTERNATIVE SINCE THE GOVERNMENT BELIEVES THE PREFERRED ALTERNATIVE CAN BE IMPLEMENTED.

2. LONE STAR REPRESENTATIVE, MALLORY MAY, COMMENTED THAT ALTERNATIVE 6 WILL COST SEVERAL MILLION DOLLARS LESS THAN ALTERNATIVE 7C.

RESPONSE: THE GOVERNMENT DOES NOT AGREE WITH THIS COMMENT. THE PRESENT VALUE COST OF ALTERNATIVE 6 IS \$11,405,000 AND THE PRESENT VALUE COST OF ALTERNATIVE 7C IS \$12,518,143 FOR A DIFFERENCE OF \$1,113,143. LONE STAR'S ORIGINAL ESTIMATE OF \$13,342,000 FOR ALTERNATIVE 7C WAS CORRECTED TO THE ABOVE, LOWER FIGURE WHEN THE STATE DISCOVERED COMPUTATIONAL ERRORS IN LONE STAR'S ANALYSIS. IN ADDITION, THE STATE OF UTAH HAS REVIEWED THE AUGUST 18, 1989 COST ESTIMATES FOR ALTERNATIVE 6 AND THE MARCH 20, 1990 FS ADDENDUM COST ESTIMATES FOR ALTERNATIVE 7B AND 7C AND HAS CONCLUDED THAT THE COSTS FOR ALTERNATIVE 6 ARE UNDERESTIMATED WHEN COMPARED TO COSTS FOR ALTERNATIVES 7B AND 7C. ALTERNATIVES 7B AND 7C INCLUDE COSTS FOR ITEMS WHICH ARE EXCLUDED FROM ALTERNATIVE 6, BUT WILL BE REQUIRED.

3. A COMMENT WAS MADE THAT WASTE CKD IS AN EXEMPT WASTE AND THEREFORE SHOULD NOT BE ADDRESSED UNDER CERCLA.

RESPONSE: EVEN THOUGH WASTE CKD IS SPECIFICALLY EXEMPT FROM BEING A HAZARDOUS WASTE UNDER RCRA, WASTE CKD IS REGULATED UNDER CERCLA BECAUSE IT CONTAINS HAZARDOUS SUBSTANCES. THE HAZARDOUS SUBSTANCES FOUND IN WASTE CKD ARE LEAD, ARSENIC, ZINC, CADMIUM, AND CHROMIUM.

4. STATE REPRESENTATIVES DANIEL H. TUTTLE AND BRENT H. GOODFELLOW COMMENTED THAT A PUBLIC MEETING NEEDED TO BE SCHEDULED FOR THE TOWN OF MAGNA AND WEST VALLEY CITY TO DISCUSS THE STATE'S PREFERRED ALTERNATIVE.

RESPONSE: A PUBLIC MEETING TO INFORM THE RESIDENTS OF MAGNA AND WEST VALLEY CITY CONCERNING THE PREFERRED ALTERNATIVE WAS HELD ON JUNE 21, 1990 AT 7:00 PM IN THE CYPRUS HIGH SCHOOL AUDITORIUM IN MAGNA.

REMEDIAL ACTION PREFERENCES

1. SENATOR WILFORD R. BLACK, MINORITY LEADER IN THE UTAH STATE SENATE, COMMENTED THAT IT WOULD BE A MUCH BETTER SOLUTION TO MOVE THE WASTE CKD FROM THE SITE TO THE COMMERCIAL HAZARDOUS WASTE DISPOSAL SITE (USPCI) IN TOOELE COUNTY.

RESPONSE: DISPOSAL OF WASTE CKD FROM THE SITE AT THE COMMERCIAL USPCI HAZARDOUS WASTE DISPOSAL FACILITY IN TOOELE COUNTY WAS CONSIDERED IN THE FS (ALTERNATIVE CKD/8), BUT WAS SCREENED OUT IN THE REPORT FROM FURTHER DETAILED ANALYSIS BECAUSE OF THE MAGNITUDE OF THE COST. DISPOSAL OF THE WASTE CKD IN AN INDUSTRIAL CELL AT THE USPCI FACILITY WAS ESTIMATED TO COST \$55 MILLION AND DISPOSAL OF THE WASTE IN A RCRA SUBTITLE C FACILITY AT USPCI WAS ESTIMATED TO COST \$120 MILLION.

2. MAGNA RESIDENT, PAMELA R. DERBIDGE, OBJECTED TO HAVING THE WASTE CKD DISPOSED OF IN THE SALT LAKE VALLEY LANDFILL OR ANYWHERE IN THE SALT LAKE VALLEY.

RESPONSE: THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) INVOLVES DISPOSAL

OF THE WASTE CKD IN AN INDUSTRIAL LANDFILL TO BE CONSTRUCTED IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL LOCATED NEAR 7200 WEST AND 1300 SOUTH IN SALT LAKE CITY. THE PREFERRED ALTERNATIVE WAS IDENTIFIED ONLY AFTER CAREFUL EVALUATION OF ALL POSSIBLE ALTERNATIVES. TWO OTHER ALTERNATIVES THAT WERE NOT SELECTED, ALTERNATIVES 7A AND 7B, INVOLVE THE EXCAVATION AND OFF-SITE DISPOSAL OF WASTE CKD IN TOOELE COUNTY. THE TOOELE COUNTY COMMISSION ADVISED THE STATE OF UTAH THAT ALTERNATIVE 7A, WHICH INVOLVES DISPOSAL OF WASTE CKD AT THE FLUX QUARRY SITE IN TOOELE COUNTY IS NOT ACCEPTABLE AND CONSEQUENTLY NOT IMPLEMENTABLE OR VIABLE BECAUSE IT IS NOT WITHIN TOOELE COUNTY'S HAZARDOUS INDUSTRIES ZONE. IN ADDITION, LONE STAR'S MARCH 20, 1990 ADDENDUM TO THE FS INDICATES THAT ALTERNATIVE 7B, WHICH INVOLVES DISPOSAL OF THE WASTE CKD AT A NONCOMMERCIAL SITE WITHIN THE TOOELE COUNTY HAZARDOUS INDUSTRIES ZONE, COULD NOT BE READILY IMPLEMENTED BECAUSE OF COMPLEXITIES AND UNCERTAINTIES PRESENTED BY THE PROPERTY ACQUISITION AND PERMITTING PROCESS.

3. SALT LAKE CITY MAYOR PALMER DEPAULIS EXPRESSED THE DESIRE TO FURTHER DISCUSS AND NEGOTIATE WITH THE TOOELE COUNTY COMMISSION ON THE USE OF THE FLUX QUARRY SITE NEAR GRANTSVILLE FOR DISPOSAL OF THE WASTE CKD.

RESPONSE: THE UTAH BUREAU OF SOLID AND HAZARDOUS WASTE ARRANGED A MEETING BETWEEN MAYOR PALMER DEPAULIS AND THE TOOELE COUNTY COMMISSION FOR FURTHER DISCUSSION ON THE POSSIBLE USE OF THE FLUX QUARRY SITE FOR DISPOSAL OF THE WASTE CKD. THAT MEETING WAS HELD ON MAY 11, 1990.

4. LONE STAR REPRESENTATIVE MALLORY MAY COMMENTED THAT SINCE THE REVISED PROPOSED PLAN INDICATED THE CONTINGENCY ALTERNATIVE IS ALSO CONSIDERED TO BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, THE STATE SHOULD SELECT A REMEDIAL ALTERNATIVE THAT DOES NOT REQUIRE OFF-SITE TRANSPORTATION OF THE WASTE CKD.

RESPONSE: WHILE IT IS TRUE THAT EPA PREFERS SITE REMEDIATIONS WHICH DO NOT INVOLVE THE OFF-SITE TRANSPORTATION OF WASTES, EACH SITE MUST BE EVALUATED ON ITS OWN MERITS. IN THIS INSTANCE THE GOVERNMENT CONSIDERED THE HIGHLY URBANIZED LOCATION OF THE PRESENT SITE AND THE GREATER PERMANENCE AND LONG-TERM SAFETY OFFERED BY AN ISOLATED, OFF-SITE INDUSTRIAL LANDFILL CONSTRUCTED FOR THE WASTE CKD TO BE COMPELLING REASONS FOR SELECTING THE OFF-SITE REMEDY.

5. MALLORY MAY, A LONE STAR REPRESENTATIVE WITH PMS INTERNATIONAL, COMMENTED THAT THERE WAS NOT SUFFICIENT JUSTIFICATION FOR CHOOSING ALTERNATIVE 7C AS THE PREFERRED ALTERNATIVE OVER ALTERNATIVES 5 OR 6.

RESPONSE: ALTERNATIVES 5 AND 6 ARE SIMILAR IN SOME RESPECTS SINCE BOTH INVOLVE THE ON-SITE CONSOLIDATION AND DISPOSAL OF WASTE CKD ON THE WEST SITE. ALTHOUGH ALTERNATIVE 5 (CONSOLIDATION OF WASTE CKD ON THE WEST SIDE) INVOLVES CONSTRUCTION OF A LAYERED CAP OVER THE WASTE CKD, THERE IS NO BOTTOM LINER PROVIDED THAT WOULD ELIMINATE CONCERNS FOR LONG-TERM LEACHING OF WASTE CKD CONTAMINANTS INTO THE GROUNDWATER. ALTERNATIVE 6 (THE CONTINGENCY ALTERNATIVE - EXCAVATION AND DISPOSAL ON-SITE) INVOLVES CONTAINMENT OF THE WASTE IN A DOUBLE-LINED INDUSTRIAL LANDFILL THAT WOULD ELIMINATE DIRECT CONTACT AND FUGITIVE DUST, AND PROTECT THE GROUND WATER AND SURFACE WATER AT THE SITE.

THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C- EXCAVATION AND OFF-SITE DISPOSAL IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL) WOULD BE AS EQUALLY PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT AS ALTERNATIVE 6. HOWEVER, IN ADDITION, AND FOR ONLY A SLIGHTLY HIGHER COST, THE SELECTED REMEDY WILL PROVIDE GREATER LONG-TERM PERMANENCE AND SAFETY BECAUSE THE NEW, OFF-SITE DISPOSAL LANDFILL WILL BE REMOVED FROM ITS PRESENT URBAN SETTING AND LOCATED IN AN ISOLATED AREA, ADJACENT TO OTHER INDUSTRIAL, DEMOLITION AND MUNICIPAL LANDFILLS NEAR AN AREA IDENTIFIED AND SET ASIDE BY SALT LAKE CITY FOR THE CONSTRUCTION OF WASTE LANDFILLS.

6. A NUMBER OF MAGNA RESIDENTS COMMENTED IN A PETITION-LIKE LETTER, THAT IT IS SHORT-SIGHTED TO PLACE HAZARDOUS MATERIALS NEAR GROWING POPULATION CENTERS BECAUSE IT WOULD MOST LIKELY NEED TO BE RELOCATED AGAIN IN THE

NEAR FUTURE.

RESPONSE: THE PREFERRED ALTERNATIVE WAS SELECTED USING NINE CRITERIA ESTABLISHED BY EPA AND WAS JUDGED TO BE THE MOST PROTECTIVE OF PUBLIC HEALTH AND THE ENVIRONMENT AND THE MOST PERMANENT. THE NEW LANDFILL WILL BE LOCATED NEAR OTHER SIMILAR MUNICIPAL AND INDUSTRIAL WASTE LANDFILLS, AND WILL BE CONSTRUCTED SO AS TO BE PERMANENT, WITH NO INTENTIONS OR PLANS FOR EVENTUAL RELOCATION.

7. A NUMBER OF MAGNA RESIDENTS COMMENTED THAT THEY OPPOSE MOVING THE WASTE CKD TO THE SALT LAKE VALLEY LANDFILL AREA WITHIN ONE MILE OF SEVEN RESIDENTIAL DWELLINGS. THEY PREFER INSTEAD, THAT THE WASTE CKD BE TRANSPORTED TO THE HAZARDOUS WASTE INDUSTRIES ZONE IN TOOELE COUNTY FOR DISPOSAL OR LEFT AT ITS PRESENT SITE NEAR REDWOOD ROAD IN SALT LAKE CITY.

RESPONSE: THESE COMMENTS HAVE BEEN ADDRESSED IN OTHER RESPONSES, BUT ARE RESTATED IN BRIEF HERE. THE PREFERRED ALTERNATIVE WAS JUDGED TO BE THE MOST PROTECTIVE OF PUBLIC HEALTH AND THE ENVIRONMENT AND THE MOST PERMANENT OF ALL THE ALTERNATIVES CONSIDERED. TOOELE COUNTY WILL NOT ALLOW THE WASTE CKD TO BE DISPOSED OUTSIDE OF THE COMMERCIAL HAZARDOUS WASTE FACILITY WITHIN ITS HAZARDOUS WASTE INDUSTRIES ZONE. ALTHOUGH THE STATE HAS IDENTIFIED ON-SITE DISPOSAL (ALTERNATIVE 6) AS ITS CONTINGENCY ALTERNATIVE, THE GOVERNMENT REGARDS THE ALTERNATIVE AS SECOND BEST BECAUSE IT IS LESS PERMANENT AND BECAUSE THE ON-SITE LANDFILL WOULD BE LOCATED IN A HIGHLY URBANIZED AREA.

8. A MAGNA RESIDENT SUGGESTED THAT THE PORTLAND CEMENT COMPANY WASTE CKD SHOULD BE COMBINED WITH THE SHARON STEEL MIDVALE TAILINGS IN DEVELOPING A REMEDIATION FOR BOTH CERCLA SITES SIMULTANEOUSLY.

RESPONSE: THIS ALTERNATIVE WAS NOT PRESENTED OR CONSIDERED IN THE FEASIBILITY STUDY PREPARED BY LONE STAR INDUSTRIES. FIRST, TECHNICAL OR ECONOMIC ADVANTAGES WOULD BE NECESSARY FOR COMBINING THE TWO WASTES. THOSE ADVANTAGES ARE NOT IMMEDIATELY OBVIOUS. SECOND, THE OWNERS OF SHARON STEEL WOULD NEED TO ACCEPT THE WASTE CKD AS A PART OF A PLAN FOR REMEDIATION OF THE MIDVALE TAILINGS. SINCE THERE ARE LIABILITIES ASSOCIATED WITH SUPERFUND WASTES, IT DOES NOT APPEAR LIKELY, AT FIRST HEARING, THAT THE OWNERS OF SHARON STEEL WOULD ALLOW THE WASTE CKD TO BE COMBINED WITH MIDVALE TAILINGS.

9. R. STEVE CREAMER, PRESIDENT OF THE EAST CARBON DEVELOPMENT COMPANY, COMMENTED THAT THE WASTE CKD COULD BE DISPOSED IN THE EAST CARBON DEVELOPMENT LANDFILL CELL #7, WHICH IS A COMMERCIAL WASTE DISPOSAL FACILITY.

RESPONSE: INCOMPLETE, NON-DETAILED ESTIMATES FOR THAT DISPOSAL, WHICH DID NOT INCLUDE OVERHEAD AND CONTINGENCIES, SHOWED A COST OF \$22.8 MILLION FOR THIS RECENTLY PROPOSED ALTERNATIVE. THE GOVERNMENT BELIEVES THAT ACTUAL COST FOR THIS DISPOSAL WOULD RANGE BETWEEN \$25 AND \$30 MILLION. THIS ALTERNATIVE WAS NOT PRESENTED OR CONSIDERED IN THE FS. THE EXPECTED COST OF \$25 TO \$30 MILLION FAR EXCEEDS THE HIGHEST COST (\$18.6 MILLION) OF THE ALTERNATIVES CONSIDERED IN THE FS AND IS APPROXIMATELY \$12.5 TO \$17.5 MILLION GREATER THAN THE COST OF THE PREFERRED ALTERNATIVE, WHICH IS \$12.5 MILLION.

TECHNICAL CONCERNS/QUESTIONS REGARDING REMEDIAL ALTERNATIVES

1. MARK GOODMANSEN OF UINTAH FREIGHTWAYS (LOCATED AT 1030 SOUTH REDWOOD ROAD, SALT LAKE CITY) COMMENTED THAT THE TRUCKING COMPANY NEEDS UNRESTRICTED ACCESS NORTH AND SOUTH ON REDWOOD ROAD FROM THEIR ENTRANCE. THE TRUCKING COMPANY IS CONCERNED ABOUT TRAFFIC ACCESS TO THE SITE DURING REMEDIATION EFFORTS, AND PARTICULARLY ACCESS FROM REDWOOD ROAD WHICH COULD NEGATIVELY IMPACT THEIR OPERATIONS AND POSE SAFETY PROBLEMS DUE TO THE HEAVY FLOW OF TRAFFIC ON REDWOOD ROAD. THE TRUCKING COMPANY SUGGESTS ACCESS TO THE SITE USING INDIANA AVENUE AND A ROAD THROUGH THE WILLIAMSEN'S LAND HOLDINGS.

RESPONSE: ACCESS TO THE SITE DURING REMEDIATION, AND PARTICULARLY TRUCK

TRAFFIC TO AND FROM THE SITE, WILL NEED TO BE CONDUCTED IN A MANNER THAT WILL CREATE THE LEAST IMPACT AND GREATEST SAFETY FOR LOCAL HIGHWAY TRAFFIC. SITE ACCESS DETAILS WILL BE DETERMINED DURING THE REMEDIAL DESIGN PHASE FOR CLEANUP OF THE SITE. THOSE DETAILS WILL BE DECIDED ONLY AFTER CONSULTATION WITH SALT LAKE CITY TRAFFIC DEPARTMENT AND THE UTAH DEPARTMENT OF TRANSPORTATION.

2. MAYOR PALMER DEPAULIS OF SALT LAKE CITY COMMENTED THAT IF THE WASTE CKD FROM THE SITE IS DISPOSED IN A LANDFILL ON THE WEST SIDE OF THE PRESENT SITE, IT WOULD BE ALMOST IMPOSSIBLE FOR SALT LAKE CITY TO DEVELOP AROUND THE LANDFILL WASTE.

RESPONSE: THE GOVERNMENT AGREES THAT IT WOULD BE DIFFICULT TO DESIGN FUTURE INDUSTRIAL DEVELOPMENT AROUND THE LANDFILL WASTE CKD ON THE WEST SIDE. THE HEIGHT OF THE ON-SITE LANDFILL MAY ALSO IMPART AN UNUSUAL AND DETRACTING VIEW IN THE RESIDENTIAL AND INDUSTRIAL SETTING OF THE AREA.

3. COUNCILMAN WAYNE HORROCKS OF THE SALT LAKE CITY COUNCIL COMMENTED THAT ISOLATION OF THE CKD ON THE WEST SIDE OF THE PRESENT SITE WOULD DEPRIVE SALT LAKE CITY OF MANY ACRES OF LAND THAT ARE HIGHLY DEVELOPABLE.

RESPONSE: THE GOVERNMENT AGREES THAT THE IMPLEMENTATION OF ALTERNATIVE 6, EXCAVATION AND ON-SITE DISPOSAL, WOULD PROBABLY ELIMINATE FOREVER THE DEVELOPMENT OF PRIME INDUSTRIAL LAND IN AN ALREADY HIGHLY URBANIZED AREA.

4. LONE STAR INDUSTRY REPRESENTATIVE MARK SCHULTHEIS COMMENTED THAT MUCH OF THE LAND IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL RECENTLY EVALUATED BY DAMES AND MOORE AT THE REQUEST OF THE STATE OF UTAH WOULD BE DEFINED AS EITHER WETLANDS OR SPECIAL AQUATIC AREAS.

RESPONSE: THE GOVERNMENT AGREES THAT MUCH OF THE LAND IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL RECENTLY EVALUATED FOR DEVELOPING ALTERNATIVE 7C APPEARS TO BE EITHER WETLANDS OR SPECIAL AQUATIC AREAS. HOWEVER, THE DETERMINATION HAS BEEN MADE BY EPA, BASED ON EXISTING INFORMATION FOR THE AREA AND ON TWO RECENT RECONNAISSANCE REPORTS OF THE AREA, THAT MORE THAN SUFFICIENT LAND EXISTS IN THE AREA EVALUATED IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL, THAT IS NEITHER WETLANDS NOR SPECIAL AQUATIC AREAS, FOR THE IMPLEMENTATION OF THE SELECTED REMEDY (ALTERNATIVE 7C).

5. LONE STAR REPRESENTATIVE MARK SCHULTHEIS COMMENTED THAT THE STATE OF UTAH HAS NOT ADEQUATELY INVESTIGATED THE ENVIRONMENTAL SUITABILITY OF THE AREA IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL FOR THE DISPOSAL OF WASTE CKD.

RESPONSE: THIS AREA IS THE SITE OF THE LARGEST, CURRENTLY OPERATING LANDFILL IN THE SALT LAKE VALLEY. MANY OTHER LANDFILLS ARE LOCATED IN THIS AREA, SOME OF WHICH HAVE BEEN CLOSED AND OTHERS THAT ARE PRESENTLY OPERATING, INCLUDING THE FOLLOWING: SALT LAKE CITY/COUNTY LANDFILLS PARCELS 1 AND 2, MACKAY LANDFILL, BLAND LANDFILL, AND E.T. TECHNOLOGIES LANDFILL. THE LATER FACILITY ACCEPTS INDUSTRIAL WASTES. THE AREA IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL IS THE ONLY AREA IN THE SALT LAKE VALLEY WHERE ZONING EXCEPTIONS ARE PRESENTLY GRANTED FOR WASTE DISPOSAL LANDFILLS. NUMEROUS HYDROGEOLOGIC INVESTIGATIONS AND OTHER STUDIES HAVE BEEN CONDUCTED FOR THE LANDFILLS IN THE AREA.

LONE STAR'S RECENT EVALUATION OF LAND IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL WAS FOR THE PURPOSE OF DEVELOPING ALTERNATIVE 7C - EXCAVATION AND DISPOSAL OFF-SITE IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL. THAT EVALUATION BECAME PART OF THE MARCH 20, 1990 ADDENDUM TO THE FS, AND CONTAINED THE SAME LEVEL OF DETAIL PROVIDED FOR THE OTHER ALTERNATIVES PRESENTED IN THE FS. THE LEVEL OF DETAIL PRESENTED FOR THE ALTERNATIVES IN THE FS APPEARS TO BE CONSISTENT WITH THE REQUIREMENTS IN THE EPA "GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA", INTERIM FINAL, OCTOBER 1988.

6. LONE STAR CONSULTANT MARK SCHULTHIES, WITH DAMES AND MOORE INCORPORATED, COMMENTED THAT IN ORDER TO TRANSPORT THE HALF MILLION TONS OF WASTE CKD FROM THE PRESENT SITE TO A NEW LANDFILL NINE MILES AWAY (NEAR THE SALT LAKE VALLEY LANDFILL), IT WOULD REQUIRE ABOUT EIGHT TO TEN TRUCKS AN HOUR, EIGHT HOURS A DAY, FIVE DAYS A WEEK, FOR TWO YEARS.

RESPONSE: THE RI/FS REPORTS PREPARED BY DAMES AND MOORE INDICATE THERE ARE APPROXIMATELY ONE-HALF MILLION CUBIC YARDS, NOT TONS, OF WASTE CKD ON THE SITE. INFORMATION PROVIDED BY LONE STAR INDICATES THAT WASTE CKD HAS A WEIGHT/VOLUME RATIO OF APPROXIMATELY 1755 LBS. PER CUBIC YARD.

CONSIDERABLY FEWER HAUL TRIPS WOULD BE NEEDED DURING THE TWO YEAR PERIOD IF 12 CUBIC YARD DUMP TRUCKS WITH 6 CUBIC YARD PUP TRAILERS WERE USED FOR THE OFF-SITE TRANSPORT OF WASTE CKD. ASSUMING 18 CUBIC YARDS PER HAUL LOAD, BETWEEN 6 AND 7 TRUCKS PER HOUR COULD TRANSPORT THE WASTE CKD OVER THE SAME PERIOD. IN LIEU OF REDUCING THE NUMBER OF 18 CUBIC YARD LOADS PER HOUR, THE ESTIMATED TWO YEAR PERIOD FOR TRANSPORTING THE WASTES OFF-SITE COULD BE SHORTENED TO LESS THAN ONE YEAR IF 10 LOADS PER HOUR WERE MADE AS SUGGESTED IN MARK SCHULTHEIS'S ABOVE COMMENT.

7. LONE STAR CONSULTANT MALLORY MAY COMMENTED THAT THE FS DOES NOT ADDRESS THE RISK ASSOCIATED WITH THE TRANSPORT OF THOUSANDS OF LOADS OF WASTE CKD TO THE VICINITY OF THE SALT LAKE CITY LANDFILL OVER A PERIOD OF TWO YEARS.

RESPONSE: COMMENTS SUBMITTED NOVEMBER 6, 1989 BY LONE STAR'S ATTORNEYS THOMAS P. O'DONNELL OF PILLSBURY, MADISON & SUTRO INCLUDED AN ANALYSIS FOR HAULING THE WASTE CKD A ROUND TRIP DISTANCE OF 80 MILES TO THE FLUX QUARRY SITE IN TOOELE COUNTY. THE ANALYSIS ASSUMED USE OF 12 CUBIC YARD DUMP TRUCKS, WHICH REQUIRED 41,000 ROUND TRIPS, FOR A TOTAL OF 3,300,000 TRUCK MILES. BASED ON ACCIDENT AND INJURY RATES PROVIDED BY THE UTAH DEPARTMENT OF TRANSPORTATION, 8 ACCIDENTS AND 16 INJURIES WERE ESTIMATED FOR THE ABOVE TRANSPORTATION OF THE WASTE.

IMPLEMENTATION OF THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) WOULD INVOLVE HAULING THE WASTE CKD A ROUND TRIP DISTANCE OF APPROXIMATELY 18 MILES TO THE SALT LAKE VALLEY LANDFILL. IF 12 CUBIC YARD DUMP TRUCKS WITH 6 CUBIC YARD PUP TRAILERS WERE USED FOR THIS HAUL, A TOTAL OF ONLY 27,000 ROUND TRIP LOADS AND 495,000 ROUND TRIP MILES WOULD BE NEEDED TO MOVE THE EXCAVATED WASTE CKD TO THE NEW INDUSTRIAL LANDFILL. THE ROUND TRIP HAUL LOADS AND ROUND TRIP MILES FOR THIS SITE ARE CONSIDERABLY LESS THAN FOR LONE STAR'S ABOVE TRAFFIC ACCIDENT ANALYSIS TO THE FLUX QUARRY SITE. SINCE THE EXACT HAUL ROUTE TO THE SALT LAKE VALLEY LANDFILL HAS NOT YET BEEN DETERMINED, (BUT WILL BE DETERMINED DURING THE RD/RA PHASE OF THIS PROJECT) ACCIDENT AND INJURY RATES FOR HAULING THE WASTE CKD FOR THIS ALTERNATIVE CANNOT BE CALCULATED. HOWEVER, IT APPEARS THAT WITH THE FAR FEWER ROUND TRIPS AND TRUCK MILES NEEDED FOR HAULING TO THE VICINITY OF THE SALT LAKE VALLEY LANDFILL, THE NUMBER OF ACCIDENTS AND INJURIES WILL LIKELY BE LESS THAN THOSE CITED BY LONE STAR INDUSTRIES FOR HAULING TO THE MORE DISTANT FLUX QUARRY SITE. ACCIDENT AND INJURY RATES FOR SALT LAKE CITY STREETS BETWEEN THE PRESENT SITE AND THE SALT LAKE VALLEY LANDFILL ARE NOT READILY AVAILABLE.

8. MARK SCHULTHEIS OF DAMES AND MOORE COMMENTED THAT ALTHOUGH THE WASTE CKD WITH ALTERNATIVE 5 WOULD BE CONSOLIDATED AND CAPPED ON THE WEST SITE, DEVELOPMENT OF THE WEST SITE WOULD STILL BE POSSIBLE, ALTHOUGH IT MIGHT BE LIMITED TO USES THAT WOULD NOT DISTURB THE CAP OVER THE WASTE CKD, AND MAY INCLUDE WAREHOUSES, PARKING LOTS, TRUCK TERMINALS, AND OTHER SHALLOW FOOTING DEVELOPMENTS.

RESPONSE: THE EXAMPLE PROVIDED IN THE ABOVE COMMENT OF POSSIBLE FUTURE USES OF THE CONSOLIDATED, CAPPED WASTE CKD ON THE WEST SITE APPEARS TO BE AN OVERSTATEMENT OF INFORMATION ALREADY PRESENTED IN THE FS. THAT INFORMATION INDICATES THAT DEED RESTRICTIONS TO PREVENT CAP DISTURBANCE WOULD PREVENT ACTIONS SUCH AS FOUNDATION FOOTINGS THAT MAY PENETRATE THE CAP, AND SITE GRADING THAT WOULD AFFECT THE CAP. THE EXAMPLES PROVIDED IN THE ABOVE COMMENT, INCLUDING TRUCK TRAFFIC OVER THE UNDERLYING,

UNCOMPACTED WASTE CKD, APPEAR TO BE UNACCEPTABLE AND INCOMPATABLE WITH CAPPED CKD WASTES ON THE WEST SITE.

9. MARLENE NORCROSS OF THE MAGNA CITY COUNCIL WONDERED ABOUT THE PERIOD OF TIME NECESSARY TO IMPLEMENT THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) BECAUSE SHE IS CONCERNED ABOUT FUGITIVE DUST EXPOSURE TO MAGNA RESIDENTS LIVING SOUTH AND WEST OF THE NEW LANDFILL AREA ON 2100 SOUTH AND 8000 WEST.

RESPONSE: THE PREFERRED ALTERNATIVE WILL BE IMPLEMENTED IN APPROXIMATELY FIVE YEARS. LAND ACQUISITION AND LANDFILL DESIGN, PERMITTING, AND CONSTRUCTION WILL REQUIRE APPROXIMATELY THREE YEARS. EXCAVATION, TRANSPORTATION, AND PLACEMENT OF THE WASTE CKD IN THE NEW LANDFILL WILL BE COMPLETED WITHIN TWO YEARS.

FUGITIVE DUST AT THE PRESENT SITE AND AT THE NEW LANDFILL SITE WILL BE EFFECTIVELY CONTROLLED BY WATER SPRAYS OR OTHER DUST SUPPRESSION TECHNIQUES. WASTE CKD PLACED IN THE NEW LANDFILL WILL BE SECURED AND COVERED IN AN ONGOING PROCEDURE WHICH WILL IMMEDIATELY ELIMINATE FUGITIVE DUST FROM THE WASTE CKD. IN ADDITION, THE STATE WILL REQUIRE AIR MONITORING FOR FUGITIVE DUST AT BOTH THE PRESENT SITE AND THE DEPOSITION SITE FOR THE NEW, OFF-SITE LANDFILL.

10. MEL INGERSOLL ASKED WHAT THE DEFINITION OF A WETLANDS IS, AND IF THE PRESENT REDWOOD ROAD SITE WOULD BE CONSIDERED AS WETLANDS.

RESPONSE: THE TERM "WETLANDS" MEANS THOSE AREAS THAT ARE INUNDATED OR SATURATED BY SURFACE OR GROUND WATER AT A FREQUENCY AND DURATION SUFFICIENT TO SUPPORT, AND THAT UNDER NORMAL CIRCUMSTANCES DO SUPPORT, A PREVALENCE OF VEGETATION TYPICALLY ADAPTED FOR LIFE IN SATURATED SOIL CONDITIONS. THROUGH THEIR BIOLOGICALLY DIVERSE AND PRODUCTIVE NATURAL HABITATS, WETLANDS PROVIDE ALL THE VITAL ELEMENTS NECESSARY TO NURTURE AND SUSTAIN MANY SPECIES OF PLANTS AND ANIMALS IMPORTANT TO HUMANKIND. IN MANY CASES, WETLANDS PROVIDE A PLACE FOR THESE SPECIES, NOT TO BE FOUND ANYWHERE ELSE ON THE EARTH. "WETLANDS" ARE REGULATED BY THE US EPA AND THE US ARMY CORPS OF ENGINEERS THROUGH FEDERAL REGULATION 40 CFR PARTS 230, 231, 33 CFR PART 323 (DISCHARGE OF DREDGE OF FILL MATERIAL INTO WATERS OF US - SECTION 404 PERMITS).

THE RI INDICATED THAT MOST OF THE PRESENT SITE WHICH HAS BEEN FILLED WITH THE WASTE CKD WAS ORIGINALLY A LOW, POORLY DRAINED SALT FLAT ENVIRONMENT. SINCE THE WASTE CKD WAS PLACED IN THIS AREA PRIOR TO THE ADOPTION OF THE FEDERAL WETLAND STANDARDS, A WETLANDS EVALUATION OF THE SITE IN ITS PREFILLED STATE WAS NEVER CONDUCTED. HOWEVER, IT APPEARS LIKELY, BASED ON THE ABOVE DESCRIPTION OF THE SITE, THAT AT LEAST SOME OF THE SITE WOULD HAVE BEEN WETLANDS OR SPECIAL AQUATIC AREAS IF IT HAD BEEN EVALUATED UNDER TODAY'S WETLAND STANDARDS. THE SURPLUS CANAL, CITY DRAIN, AND NORTH BOUNDARY DITCH ARE CONSIDERED TO BE WATERWAYS OF THE US, AND AS SUCH ARE REGULATED UNDER THE FEDERAL DREDGE AND FILL REQUIREMENTS.

11. MEL INGERSOLL COMMENTED THAT IF THE ON-SITE LANDFILL (THE CONTINGENCY REMEDY - ALTERNATIVE 6) WILL BE 30 OR EVEN 10, 12, OR 15 FEET DEEP (HIGH), HOW WILL INDUSTRIAL COMPLEXES BE CONSTRUCTED ON TOP OF THAT LANDFILL.

RESPONSE: THE FS INDICATES THAT DEED RESTRICTIONS ON LANDFILL DISTURBANCE WOULD APPLY TO SUCH ACTIONS AS FOUNDATION FOOTINGS THAT MAY PENETRATE THE LANDFILL CAP, AND SITE GRADING THAT WOULD AFFECT THE LANDFILL CAP. SLAB-ON-GRADE FOUNDATIONS OR OTHER ACTIONS THAT WOULD NOT DISTURB THE LANDFILL CAP WOULD NOT BE RESTRICTED. THE GOVERNMENT HAS SOME SERIOUS RESERVATIONS ABOUT THE PRACTICALITY OF HAVING BUILDINGS OR OTHER STRUCTURES CONSTRUCTED ON THE ELEVATED ON-SITE LANDFILL. ALTHOUGH THE ENGINEERING OF SOME OF THE SUGGESTED STRUCTURES (I.E. WAREHOUSES, PARKING LOTS, AND TRUCK TERMINALS) MAY BE POSSIBLE FROM AN ENGINEERING VIEWPOINT, AS A PRACTICAL MATTER, SUCH STRUCTURES ON THE LANDFILL APPEAR TO BE INADVISABLE. THIS RESPONSE IS SIMILAR TO AN EARLIER RESPONSE IN THE RESPONSIVENESS SUMMARY DEALING WITH ALTERNATIVE 5.

12. MAYOR PALMER DEPAULIS OF SALT LAKE CITY COMMENTED THAT DISPOSAL OF THE WASTE CKD AT THE FLUX QUARRY SITE SOUTH OF GRANTSVILLE IN TOOELE COUNTY, UTAH WOULD HAVE NO NEGATIVE ENVIRONMENTAL AFFECTS.

RESPONSE: ALTHOUGH AN EVALUATION OF THE FLUX QUARRY SITE WAS CONDUCTED BY LONE STAR INDUSTRIES AND INCLUDED IN THE FS FOR THEIR DEVELOPMENT OF ALTERNATIVE 7A (EXCAVATION AND DISPOSAL OFF-SITE AT THE FLUX QUARRY SITE IN TOOELE COUNTY), THAT EVALUATION DOES NOT SHOW CONCLUSIVELY THAT NO NEGATIVE ENVIRONMENTAL EFFECTS WILL RESULT IF THE ALTERNATIVE IS IMPLEMENTED. ADDITIONAL STUDY OF THE SITE WILL BE NEEDED TO ARRIVE AT THAT CONCLUSION. NO BOTTOM LINER IS PROPOSED FOR THIS ALTERNATIVE AND THE FRACTURED, FISSURED NATURE OF THE LIMESTONE/SHALE QUARRIES IN THE AREA WOULD LIKELY BE CONDUCIVE TO LEACHING OF CONTAMINANTS FROM THE WASTE CKD INTO THE UNDERLYING GROUND WATER.

13. K.W. NELSON, PRIVATE CITIZEN, COMMENTED THAT THE USE OF INSTITUTIONAL CONTROLS, BOTH CURRENTLY AND IN THE FUTURE, WILL GREATLY REDUCE THE RISK POSED TO FUTURE WORKERS AND TRESPASSERS AND ALSO REDUCE DUST EMISSIONS.

RESPONSE: IN ESTABLISHING AND EVALUATING THE BASELINE RISK POSED BY A SITE, THE SUPERFUND PROGRAM DOES NOT ALLOW FOR THE INCLUSION OF INSTITUTIONAL CONTROLS. WHILE INSTITUTIONAL CONTROLS MAY BE CONSIDERED AS PART OF THE REMEDIATION, THEY ARE GENERALLY NOT CONSIDERED PERMANENT AND THEREFORE DO NOT ADDRESS FUTURE POTENTIAL RISKS EFFECTIVELY. THE BASELINE RISK ASSESSMENT ASSUMES A "NO ACTION" ALTERNATIVE AND THEN CALCULATES REASONABLE AND MAXIMUM RISKS POSED BY A SITE.

14. K.W. NELSON, PRIVATE CITIZEN, COMMENTED THAT SILICOSIS IS UNLIKELY TO RESULT FROM INHALATION OF THE MATERIALS FOUND ON-SITE DUE TO LOW INHALATION POTENTIAL AND INFREQUENT EXPOSURE.

RESPONSE: HISTORICALLY, THERE HAS BEEN MINIMAL DUST CONTROL AND SIGNIFICANT EVENTS OF BLOWING DUST FROM THE SITE HAVE BEEN DOCUMENTED. IN ADDITION, DUST SUPPRESSION AS AN INSTITUTIONAL CONTROL CANNOT BE COMPLETELY GUARANTEED INTO THE FUTURE. THEREFORE THERE REMAINS THE POTENTIAL FOR SUFFICIENT DUST TO BE ENTRAINED SO AS TO CAUSE ADVERSE HEALTH EFFECTS.

15. K.W. NELSON, PRIVATE CITIZEN, COMMENTED THAT DETAILED AND EXTENSIVE AIR MONITORING SHOULD HAVE BEEN CONDUCTED SO AS TO BETTER QUANTIFY THE AIR EXPOSURE ROUTE.

RESPONSE: ON-SITE ENVIRONMENTAL DATA IS GENERALLY THE MOST REPRESENTATIVE OF TRUE CONDITIONS AT A GIVEN SITE. THIS DATA, HOWEVER, CAN BE EXTREMELY TIME CONSUMING AND EXPENSIVE TO COLLECT, THEREFORE, A MORE EFFICIENT WAY TO CHARACTERIZE THE AIR PATHWAY AT THIS SITE WAS USED BY MODELLING THE EXPECTED EMISSIONS. MODELLING EFFORTS PROVIDE SUFFICIENT INFORMATION IN ORDER TO ADEQUATELY CHARACTERIZE THE AIR PATHWAY FOR REMEDIAL DECISION-MAKING.

16. K.W. NELSON, PRIVATE CITIZEN, COMMENTED THAT WASTE CKD IS ONLY A NUISANCE DUST, NOT A HAZARD.

RESPONSE: WASTE CKD CONTAINS A VARIETY OF HAZARDOUS SUBSTANCES INCLUDING ARSENIC, CHROMIUM, LEAD, ZINC, AND CADMIUM. DUE TO THE LARGE VOLUME OF MATERIAL PRESENT, THE CAUSTIC NATURE OF THAT MATERIAL, AND THE PROXIMITY OF A RESIDENTIAL AREA, WASTE CKD PRESENTS A POTENTIAL FOR FUTURE ADVERSE HEALTH EFFECTS.

17. K.W. NELSON, PRIVATE CITIZEN, COMMENTED THAT THE GROUND WATER UNDER THE SITE IS UNUSABLE DUE TO POOR BACKGROUND CONDITIONS.

RESPONSE: UTAH IS AN ARID STATE WHERE WATER RESOURCES CAN OFTEN BE THE LIMITING FACTOR FOR GROWTH OF AN AREA. THEREFORE ALL WATER RESOURCES ARE VALUABLE AND WORTHY OF PROTECTION. WHILE THE WATER UNDER THE SITE MAY NOT BE SUITABLE AS DIRECT DRINKING WATER SOURCE, THERE ARE A VARIETY

OF OTHER USES FOR THE WATER, INCLUDING IRRIGATION, MANUFACTURING, AND BLENDING WITH OTHER SOURCES.

18. MAYOR PALMER DEPAULIS OF SALT LAKE CITY COMMENTED THAT THE LANDFILL CONSTRUCTED ON THE WEST SITE FOR ALTERNATIVE 6 WOULD BE OVER 30 FEET HIGH.

RESPONSE: DEPENDING ON THE SHAPE OF THE LANDFILL AND THE SLOPE OF THE SIDES, THE TOTAL HEIGHT OF THE 25-ACRE, ON-SITE LANDFILL FOR ALTERNATIVE 6, INCLUDING THE COVER AND LINER THICKNESSES, COULD REACH 30 FEET, BUT WILL PROBABLY BE CLOSER TO 25 FEET.

THE INDUSTRIAL LANDFILL TO BE CONSTRUCTED FOR ALTERNATIVE 7C (THE SELECTED REMEDY) WILL ALSO OCCUPY 25 ACRES AND IS EXPECTED TO HAVE THE SAME TOTAL HEIGHT OF ABOUT 25 FEET.

19. ROMNEY M. STEWART OF THE SALT LAKE VALLEY SOLID WASTE MANAGEMENT COUNCIL EXPRESSED CONCERNS REGARDING THE STATE'S PREFERRED ALTERNATIVE: (1) SINCE THE PROPERTY ADJACENT TO THE NEW LANDFILL SITE IS OWNED BY OTHER ENTITIES, WILL ADEQUATE MONITORING WELLS AND OTHER NECESSARY TESTING EQUIPMENT BE INSTALLED TO PROTECT THOSE PROPERTIES FROM A RELEASE, (2) THE NEARBY RESIDENTS, LANDFILL EMPLOYEES, AND PUBLIC NEED TO BE ASSURED THAT FUGITIVE DUST FROM THE LANDFILL WILL BE ADEQUATELY CONTROLLED, (3) THE SITE IS NOT "ISOLATED" SINCE THERE ARE RESIDENTIAL DWELLINGS WITHIN ONE MILE OF THE NEW LANDFILL SITE, (4) BECAUSE OF THE HEAVY TRAFFIC FLOW TO THE LANDFILL AREA, TRUCK TRAFFIC TO THE NEW LANDFILL SITE SHOULD PROCEED WEST ALONG I-80 TO 7200 WEST, THEN SOUTH TO THE SITE, AND (5) THE STATE OF UTAH SHOULD OBTAIN WRITTEN DOCUMENTATION FROM THE AGENCY RESPONSIBLE FOR PROTECTION OF WETLANDS THAT THE NEW OFF-SITE INDUSTRIAL LANDFILL UNDER THE STATE'S PREFERRED ALTERNATIVE WILL NOT BE CONSTRUCTED IN WETLANDS OR IN AN AREA THAT WILL IMPACT WETLANDS.

RESPONSE:

(1) A LEAK DETECTION AND MONITORING SYSTEM WILL BE INSTALLED FOR THE NEW DOUBLE-LINED, INDUSTRIAL LANDFILL.

(2) FUGITIVE DUST RESULTING FROM THE EXCAVATION, LOADING, TRANSPORTATION AND PLACEMENT OF WASTE CKD WILL BE CONTROLLED AT BOTH THE PRESENT SITE AND THE NEW OFF-SITE LANDFILL BY MEANS OF WATER SPRAYS AND OTHER DUST SUPPRESSION TECHNIQUES. AIR MONITORING INSTRUMENTS WILL BE ESTABLISHED NEAR BOTH SITES TO INSURE ADEQUATE DUST SUPPRESSION METHODS ARE USED.

(3) THE GOVERNMENT FEELS THAT THE SITE FOR THE NEW LANDFILL IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL IS "ISOLATED" IN THE SENSE THAT IT IS "SET APART" FROM AREAS OF HUMAN HABITATION. THE NEW LANDFILL WOULD BE CONSTRUCTED NEAR OTHER WASTE LANDFILLS, FOR MUNICIPAL AND INDUSTRIAL WASTES, THAT ARE ALSO ISOLATED AND SET APART FROM HUMAN HABITATION. ALTHOUGH THERE ARE SEVEN RESIDENTIAL DWELLINGS LOCATED APPROXIMATELY ONE MILE FROM THE DISPOSAL AREA, THOSE DWELLINGS ARE ABOUT THE SAME DISTANCE FROM OTHER EXISTING LANDFILLS IN THE AREA. THE RELATIVE RISKS ASSOCIATED WITH THE NEW LANDFILL SITE ARE LESS THAN FOR THE PRESENT SITE, WHICH HAS A POPULATION OF 6,000 TO 12,000 PEOPLE WITHIN ONE MILE OF THE SITE.

(4) THE SAFEST AND MOST EFFICIENT HAUL ROUTE WILL BE ESTABLISHED BY THE UTAH DEPARTMENT OF TRANSPORTATION, AND BY THE SALT LAKE CITY TRAFFIC DEPARTMENT IF CITY ROADS ARE USED.

(5) BASED ON WETLANDS EVALUATION REPORTS PREPARED ON THE AREA BY TWO ENVIRONMENTAL CONSULTING FIRMS, EPA WROTE LONE STAR INDUSTRIES ON MAY 22, 1990 CONCLUDING THAT SUFFICIENT UPLANDS EXIST ON TWO OF THE FIVE PARCELS STUDIED TO ALLOW DEVELOPMENT OF A NEW INDUSTRIAL LANDFILL (25-30 ACRES) WITHOUT IMPACTING WETLANDS. ALTHOUGH BOTH CONSULTING FIRM REPORTS ARE CONSIDERED AT THE "RECONNAISSANCE LEVEL", THEY OFFERED SUFFICIENT LEVEL AND QUALITY OF DATA FOR EPA TO ARRIVE AT THIS CONCLUSION ON THE RI/FS PHASE OF THIS PROJECT.

20. LARRY ARGYLE, PRESIDENT OF THE MAGNA AREA COUNCIL, EXPRESSED SEVERAL

CONCERNS REGARDING THE STATE'S PREFERRED ALTERNATIVE: (1) THE PRELIMINARY WETLANDS EVALUATION BY ECOTONE ENVIRONMENTAL CONSULTING LIMITS CONSIDERATION OF PROPERTY ADJACENT TO 7200 WEST AND SOUTH OF 1300 SOUTH TO APPROXIMATELY 1700 SOUTH WHICH IS WITHIN APPROXIMATELY ONE-HALF MILE OF SEVEN FAMILIES WHO ARE TOTALLY DEPENDENT ON THEIR PRIVATE WELLS FOR THEIR SOURCE OF WATER, (2) THE NEW LANDFILL FOR WASTE CKD SHOULD NOT BE CONSTRUCTED ALONG 7200 WEST BECAUSE A MAJOR THOROUGHFARE WILL BE BUILT ALONG THE CORRIDOR INTO MAGNA AND WEST VALLEY CITY, (3) COMMISSIONER BILL PITT OF TOOELE COUNTY HAS INDICATED A WILLINGNESS ON THE PART OF TOOELE COUNTY TO ACCEPT THE WASTE CKD WITHIN ITS HAZARDOUS MATERIALS ZONE, AND HAS SUGGESTED POSSIBLE NEGOTIATIONS OR LAND SWAPS OF STATE AND BLM LAND THAT COULD CUT THE COST OF DISPOSAL AT THE TOOELE SITE.

RESPONSE:

(1) THE STATE REQUESTED THAT LONE STAR EVALUATE LAND IN A PORTION OF SECTION 10 AND IN THE NORTHEAST CORNER OF SECTION 16 NEAR THE SALT LAKE VALLEY LANDFILL FOR POSSIBLE DISPOSAL OF THE WASTE CKD. BASED ON THAT EVALUATION, SUITABLE PROPERTY EXISTS AT A DISTANCE OF ONE MILE OR MORE FROM 2100 SOUTH. SINCE THE NEW LANDFILL WILL BE DOUBLE-LINED AND PROVIDED WITH LEAK DETECTION AND MONITORING SYSTEMS, IT WILL NOT IMPACT THE AQUIFER FOR THE PRIVATE WELLS SERVING THE NEAREST RESIDENTS.

(2) THREE LANDFILLS HAVE ALREADY BEEN CONSTRUCTED ALONG 7200 WEST. TWO OF THOSE LANDFILLS, SALT LAKE COUNTY LANDFILLS PARCELS I AND II ARE NO LONGER IN USE AND HAVE BEEN CLOSED. NEITHER OF THESE LANDFILLS IMPART AN UNSIGHTLY APPEARANCE TO THE AREA IN THEIR CLOSED, CAPPED STATE. SALT LAKE COUNTY LANDFILL PARCEL II, NEAR THE NORTH BORDER OF SECTION 16 OCCUPIES 80 ACRES AND IS 30 FEET HIGH, MAKING IT BOTH HIGHER AND LARGER THAN THE NEW LANDFILL FOR THE WASTE CKD, WHICH WOULD OCCUPY ONLY 25 ACRES AND BE APPROXIMATELY 25 FEET HIGH. THE CLOSED AND CAPPED CONDITION OF THIS HIGHER LANDFILL, IN PARTICULAR, ENHANCES THE RELIEF AND VIEW OF THE AREA. THE BLAND LANDFILL, LOCATED EAST OF 7200 WEST, IS A DEMOLITION LANDFILL IN OPERATION AT THE PRESENT TIME. PILES OF DEBRIS AWAITING BURIAL ARE THEREFORE FREQUENTLY VISIBLE FROM 7200 WEST ROAD. THE NEW INDUSTRIAL LANDFILL FOR THE WASTE CKD WILL NOT BE BUILT ON THE CORRIDOR FOR THE 7200 WEST STREET, AND WILL NOT IMPACT IN ANY WAY THE CONSTRUCTION OF THAT STREET. FINALLY, AS A POINT OF CLARIFICATION, MAYOR PALMER DEPAULIS' OFFICE IN SALT LAKE CITY HAS INFORMED THE STATE THAT THE 7200 WEST STREET IS NOT SCHEDULED TO BE BUILT FOR AT LEAST FIVE YEARS.

(3) ON MAY 11, 1990 COMMISSIONER BILL PITT MET WITH OFFICIALS OF SALT LAKE CITY AND THE STATE OF UTAH ON THIS ISSUE. ALTHOUGH COMMISSIONER PITT INDICATED THERE WERE NO RESTRICTIONS ON DISPOSING OF THE WASTE CKD IN AN INDUSTRIAL WASTE DISPOSAL CELL AT THE USPCI COMMERCIAL FACILITY IN TOOELE COUNTY, THAT ALTERNATIVE HAS BEEN SCREENED OUT EARLIER BECAUSE OF ITS EXCESSIVE COST (APPROX. \$55 MILLION). COMMISSIONER PITT REITERATED TOOELE COUNTY'S EARLIER POSITION THAT (1) THE FLUX QUARRY SITE IS UNACCEPTABLE FOR THE DISPOSAL OF WASTE CKD, AND (2) TOOELE COUNTY WILL NOT ACCEPT THE WASTE CKD IN THE HAZARDOUS WASTE INDUSTRIES ZONE IF IT WILL BE OUTSIDE THE COMMERCIAL HAZARDOUS WASTE FACILITY. LONE STAR'S OWN EVALUATION OF THIS ALTERNATIVE (ALTERNATIVE 7B) SHOWED THAT IT COULD NOT BE READILY IMPLEMENTED BECAUSE OF COMPLEXITIES AND UNCERTAINTIES PRESENTED IN THE PROPERTY ACQUISITION AND PERMITTING PROCESS.

21. SOME MAGNA RESIDENTS COMMENTED THAT (1) THE IMPLEMENTATION OF THE PREFERRED ALTERNATIVE WOULD CREATE AN "EYESORE" AND EITHER STOP OR HINDER THE CONSTRUCTION OF THE 7200 WEST ROAD FROM THE MAGNA AREA NORTH TO I-80, AND (2) SINCE THE WASTE CKD HAS CONTAMINATED THE GROUND WATER AT THE PRESENT SITE, THE WASTE CKD WOULD DEFINITELY CONTAMINATE THE GROUND WATER AT THE NEW LANDFILL SITE NEAR THE SALT LAKE VALLEY LANDFILL.

RESPONSE:

(1) THE GOVERNMENT DOES NOT AGREE THAT THE IMPLEMENTATION OF THE PREFERRED ALTERNATIVE WILL STOP OR HINDER THE CONSTRUCTION OF 7200 WEST ROAD. OTHER LANDFILLS ALREADY EXIST ALONG THE 7200 WEST CORRIDOR. CLOSED SALT LAKE COUNTY PARCEL II LANDFILL IS LARGER AND HIGHER THAN THE NEW LANDFILL FOR THE PREFERRED ALTERNATIVE; IN ITS CAPPED STATE IT IS

NOT AN "EYESORE", DOES NOT DETRACT FROM THE VIEW OF THE AREA, AND ITS RELIEF GIVES THE APPEARANCE OF A NATURAL HILL.

(2) GROUND WATER BENEATH THE PRESENT REDWOOD ROAD SITE FOR THE PORTLAND CEMENT CO. SUPERFUND SITE DUST HAS BEEN CONTAMINATED IN PART BECAUSE (A) THE WASTE CKD WAS USED AS FILL IN A NATURALLY LOW AREA AND HAS BEEN IN SEASONAL AND/OR CONTINUAL CONTACT WITH THE GROUND WATER FOR MANY YEARS AND (B) A DEEP, GRAVEL ENCASED, SEWER ALIGNMENT THROUGH THE PRESENT SITE ALSO APPEARS TO HAVE FACILITATED THE CONTAMINATION OF THE GROUND WATER ON THE SITE.

THE INDUSTRIAL LANDFILL UNDER THE PREFERRED ALTERNATIVE WILL BE COMPLETELY CONTAINED WITH A DOUBLE BOTTOM LINER AND A LAYERED CAP THAT WILL PREVENT CONTAMINATION OF GROUND WATER BENEATH THE SITE. A LEAK DETECTION AND GROUND WATER MONITORING SYSTEM WILL ALSO BE INSTALLED TO INSURE THE INTEGRITY OF THE BOTTOM LINERS AND LAYERED CAP.

22. BRENT HUISH, DISTRICT MANAGER OF THE MAGNA WATER COMPANY COMMENTED THAT (1) HIS COMPANY DRAWS SOME OF ITS WATER FROM THE HAYNES WELL FIELD LOCATED AT APPROXIMATELY 5700 WEST 2100 SOUTH IN MAGNA, UTAH. MAGNA WATER COMPANY IS OPPOSED TO THE PREFERRED ALTERNATIVE BECAUSE IT BELIEVES THAT THE AQUIFER FROM WHICH THE HAYNES WELL FIELD DRAWS WILL BE COMPROMISED BY OFF-SITE DISPOSAL OF WASTE CKD NEAR THE SALT LAKE VALLEY LANDFILL, AND (2) MAGNA WATER COMPANY BELIEVES THAT ALTERNATIVE 11 (SOLIDIFICATION WITH PORTLAND CEMENT AND ON-SITE REPLACEMENT) WOULD BE A BETTER PREFERRED ALTERNATIVE AND WOULD CAUSE LESS RISK OF CONTAMINATION TO THE AQUIFER SERVICING THE HAYNES WELL FIELD.

RESPONSE:

(1) THE NEW INDUSTRIAL LANDFILL CONSTRUCTED UNDER THE PREFERRED ALTERNATIVE WILL BE DOUBLE-LINED AND COVERED WITH A LAYERED CAP. THESE DESIGN FEATURES WILL PREVENT THE INFILTRATION OF PRECIPITATION INTO THE LANDFILLED WASTE CKD AND THE SUBSEQUENT MOVEMENT OF THE CONTAMINATED LEACHATE INTO THE UNDERLYING GROUND WATER. IN ORDER, TO INSURE THE INTEGRITY OF THE BOTTOM LINERS AND THE LAYERED CAP, LEAK DETECTION AND MONITORING SYSTEMS WILL BE DEVELOPED FOR THE LANDFILL. CONSEQUENTLY, CONTAMINATION OF THE GROUNDWATER BENEATH THE LANDFILL WILL NOT OCCUR. IN ADDITION, THE SITE FOR THE NEW NONCOMMERCIAL, INDUSTRIAL LANDFILL IS LOCATED HYDROGEOLOGICALLY DOWNGRAIENT FROM THE AREA OF THE HAYNES WELL FIELD.

(2) THE GOVERNMENT DEVOTED A GREAT DEAL OF ATTENTION AND STUDY TO ALTERNATIVE 11 AND 12 (SOLIDIFICATION RESPECTIVELY WITH PORTLAND CEMENT AND FLY ASH). UNFORTUNATELY, THESE ALTERNATIVES WERE NOT CONSIDERED VIABLE BECAUSE THE PERFORMANCE OF THE SOLIDIFIED WASTE CKD, ITS LONG-TERM PHYSICAL STABILITY, AND ITS ABILITY TO RESIST LEACHING INTO GROUND WATER OVER TIME WERE NOT DEMONSTRATED BY LONE STAR INDUSTRIES.

23. LONE STAR CONSULTANT MARK D. SCHULTHEIS OF DAMES & MOORE COMMENTED THAT: (1) THE PRESENCE OF SEVEN CERCLIS SITES IN THE VICINITY OF THE SALT LAKE VALLEY LANDFILL RAISE THE POSSIBILITY THAT THOSE PROPERTIES BEING CONSIDERED FOR THE CONSTRUCTION OF THE NEW LANDFILL UNDER THE PREFERRED ALTERNATIVE MAY ALREADY BE AFFECTED BY CONTAMINATION FROM A CERCLIS SITE, AND (2) A PRESENT VALUE COST OF \$13,342,000 WAS CITED FOR ALTERNATIVE 7C, THE PREFERRED ALTERNATIVE.

RESPONSE:

(1) SEVERAL OF THE CERCLIS SITES IN THIS AREA HAVE BEEN OR ARE BEING STUDIED AS A PART OF THE CERCLA PROCESS. THE NEAREST CERCLIS SITES TO THE AREAS BEING CONSIDERED FOR THE NEW LANDFILL ARE THE BLAND LANDFILL AND THE SALT LAKE COUNTY LANDFILLS PARCELS I AND II. A RECENT STUDY ON THE LATTER TWO LANDFILLS BY THE UTAH BUREAU OF SOLID AND HAZARDOUS WASTE CONCLUDED THERE WAS NO RELEASE OF CONTAMINANTS TO THE ENVIRONMENT. ALTHOUGH IT APPEARS UNLIKELY THAT THE AREAS BEING CONSIDERED FOR THE NEW LANDFILL HAVE BEEN CONTAMINATED BY WASTES IN THE NEARBY CERCLIS SITES, A MONITORING PROGRAM TO ESTABLISH BASELINE PREREMEDIATION AIR, SOIL AND

GROUNDWATER QUALITY AT THE NEW LANDFILL SITE WILL BE INSTALLED.

(2) COST ESTIMATES FOR THE PREFERRED ALTERNATIVE (ALTERNATIVE 7C) PROVIDED IN LONE STAR'S MARCH 20, 1989 FS ADDENDUM INFORMATION SHOWED A PRESENT VALUE COST OF \$13,342,000. THE STATE OF UTAH DISCOVERED A COMPUTATIONAL ERROR IN THIS ESTIMATE WHICH INFLATED ITS COST BY APPROXIMATELY \$850,000. A REVISED ESTIMATE FOR ALTERNATIVE 7C PROVIDED BY LONE STAR INDUSTRIES ON APRIL 13, 1990 SHOWS A CORRECTED PRESENT VALUE COST OF \$12,518,143.

24. DON OSTLER, DIRECTOR OF THE UTAH BUREAU OF WATER POLLUTION CONTROL COMMENTED THAT (1) HIS BUREAU IS CONCERNED THAT ONCE THE VISIBLE SOURCE OF CONTAMINATION IS DEALT WITH, GROUND WATER CONTAMINATION MAY NOT HAVE A HIGH PRIORITY WHEN CERCLA FUNDS ARE ALLOCATED IN FUTURE YEARS, (2) SINCE THE EVALUATION OF THE GROUND WATER ON THE PORTLAND SITE WAS MADE USING THE EPA GROUND WATER CLASSIFICATION, A REEVALUATION OF THE GROUND WATER IS NEEDED USING UTAH'S CURRENT GROUND WATER CLASSIFICATION SYSTEM, AND (3) THE OFF-SITE INDUSTRIAL LANDFILL PROPOSED UNDER THE STATE'S PREFERRED ALTERNATIVE WILL NOT BE A CERCLA FACILITY. CONSEQUENTLY, A GROUND WATER DISCHARGE PERMIT APPEARS TO BE REQUIRED FOR THIS NEW LANDFILL SINCE IT IS NOT "PERMITTED BY RULE".

RESPONSE:

(1) IT IS THE GOVERNMENT'S POSITION THAT THE SOURCE OF CONTAMINATION ON THE PRESENT SITE (THE WASTE CKD) MUST BE CONTROLLED OR REMOVED BEFORE THE CONTAMINATED GROUND WATER ASSOCIATED WITH THE SITE CAN BE REMEDIATED. OPERABLE UNIT 1 WILL CONTROL OR ELIMINATE THAT SOURCE OF CONTAMINATION. SUBSEQUENT OPERABLE UNIT(S) WILL ADDRESS REMEDIATION OF RESIDUAL SOILS, TREATMENT AND DISPOSAL OF THE CHROME BRICKS AND CLEANUP OF THE CONTAMINATED GROUND WATER) ASSOCIATED WITH THE SITE.

(2) EPA GROUND WATER CLASSIFICATION DATA WAS USED IN THE RI/FS FOR EVALUATING GROUND WATER AT THE SITE BECAUSE THE STATE'S "GROUND-WATER QUALITY PROTECTION REGULATIONS" WERE NOT YET ADOPTED. THOSE REGULATIONS WERE NOT ADOPTED UNTIL AUGUST, 1989. IT IS NOT POSSIBLE TO DELAY REMEDIATION OF OPERABLE UNIT 1 WHILE REEVALUATION OF THE GROUND WATER IS PERFORMED USING THE STATE'S NEW GROUND WATER REGULATION. HOWEVER, THAT REGULATION WILL BE USED AND CITED AS AN ARAR IN EVALUATING REMEDIAL ALTERNATIVES FOR REMEDIATION OF THE CONTAMINATED GROUND WATER IN THE SUBSEQUENT OPERABLE UNIT(S).

(3) IF A GROUND WATER DISCHARGE PERMIT IS REQUIRED FOR THE NEW OFF-SITE, INDUSTRIAL LANDFILL, THAT PERMIT, ALONG WITH EVERY OTHER REQUIRED PERMIT, WILL BE OBTAINED.

25. KATHY JENKINS OF MAGNA COMMENTED THAT IMPLEMENTATION OF THE PREFERRED ALTERNATIVE WILL INTERFERE WITH THE NEW BUSINESSES THAT ARE BEING DEVELOPED ALONG 5600 WEST AND DELAY COMPLETION OF THE I-215 FREEWAY TO MAKE 7200 WEST A THROUGH WAY FROM 2100 SOUTH TO I-80.

RESPONSE: THE GOVERNMENT DOES NOT AGREE WITH THIS COMMENT. UNDER THE PREFERRED ALTERNATIVE, THE NEW LANDFILL WILL BE CONSTRUCTED NEAR 7200 WEST, AND NOT ALONG 5600 WEST. THIS NEW LANDFILL WILL NOT HAVE ANY ADVERSE AFFECT ON BUSINESS DEVELOPMENT ALONG 5600 WEST, NOR WILL IT ADVERSELY AFFECT FUTURE BUSINESS DEVELOPMENT ALONG 7200 WEST, OR THE CONSTRUCTION OF THE 7200 WEST ROAD FROM 2100 SOUTH TO I-80.

REMAINING CONCERNS

ISSUES AND CONCERNS THAT THE GOVERNMENT WAS UNABLE TO ADDRESS DURING REMEDIAL PLANNING ACTIVITIES INCLUDE:

- * WHAT WOULD BE THE IMPACT OF THE REMEDIAL DECISION FOR THIS SITE ON THE ULTIMATE REMEDY SELECTION FOR OTHER WASTE CKD SITES THROUGHOUT THE NATION?

RESPONSE: INSUFFICIENT DATA IS AVAILABLE AT THIS TIME TO ASSESS THE IMPACTS.

ATTACHMENT - SUMMARY OF RECENT COMMUNITY RELATIONS ACTIVITIES

THE COMMUNITY RELATIONS ACTIVITIES AT THE PORTLAND CEMENT CO. (KILN DUST #2 & #3) SINCE COMPLETION OF THE RI/FS REPORTS AND RELEASE OF THE INITIAL AND REVISED PROPOSED PLANS HAS INCLUDED THE FOLLOWING:

- * AN INFORMATION REPOSITORY IS MAINTAINED FOR THIS SITE BY THE STATE OF UTAH, BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION, ON THE FOURTH FLOOR OF THE CANNON HEALTH BUILDING AT 288 NORTH 1460 WEST, SALT LAKE CITY, UTAH. OTHER REPOSITORIED FOR THIS INFORMATION ARE MAINTAINED AT THE CHAPMAN BRANCH OF THE SALT LAKE CITY PUBLIC LIBRARY AND AT THE OFFICES OF THE US ENVIRONMENTAL PROTECTION AGENCY IN DENVER, COLORADO.
- * THE NOTICE OF AVAILABILITY OF THE RI/FS REPORTS WAS PUBLISHED IN THE DESERET NEWS AND THE SALT LAKE CITY TRIBUNE ON SEPTEMBER 11, 1989.
- * THE STATE OF UTAH RELEASED THE RI/FS REPORTS FOR PUBLIC COMMENT ON SEPTEMBER 13, 1989.
- * A PUBLIC MEETING TO ANNOUNCE THE AVAILABILITY OF THE RI/FS REPORT WAS HELD ON SEPTEMBER 21, 1989. A BRIEF SUMMARY OF THE RI/FS REPORT WAS ALSO PRESENTED IN THAT MEETING.
- * THE INITIAL PROPOSED PLAN WAS RELEASED FOR PUBLIC COMMENT ON OCTOBER 16, 1989.
- * THE NOTICE OF AVAILABILITY OF THE INITIAL PROPOSED PLAN WAS PUBLISHED IN THE DESERET NEWS AND THE SALT LAKE CITY TRIBUNE ON OCTOBER 17, 1989.
- * A PUBLIC COMMENT PERIOD ON THE INITIAL PROPOSED PLAN WAS HELD FROM OCTOBER 16, 1989 THROUGH NOVEMBER 6, 1989.
- * THE STATE OF UTAH PREPARED AND DISTRIBUTED A FACT SHEET ON THE SITE ON NOVEMBER 1, 1989. IT PROVIDED BACKGROUND INFORMATION AND AN UPDATE ON SITE ACTIVITIES. SEVERAL EARLIER FACT SHEETS WERE ALSO PREPARED ON THIS SITE DURING RI/FS ACTIVITIES.
- * A PUBLIC MEETING WAS HELD ON NOVEMBER 1, 1989 TO RECEIVE PUBLIC COMMENTS ON THE INITIAL PROPOSED PLAN. APPROXIMATELY 50 PEOPLE ATTENDED, INCLUDING CITIZENS, ELECTED OFFICIALS, STATE AND EPA OFFICIALS, AND TECHNICAL AND LEGAL REPRESENTATIVES OF LONE STAR INDUSTRIES. A TRANSCRIPT OF THIS HEARING IS AVAILABLE FOR REVIEW AT THE CHAPMAN BRANCH OF THE SALT LAKE CITY LIBRARY, THE OFFICES OF THE UTAH BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION, AND THE DENVER OFFICES OF THE US EPA.
- * THE NOTICE OF AVAILABILITY OF THE REVISED PROPOSED PLAN WAS PUBLISHED IN THE DESERET NEWS AND THE SALT LAKE CITY TRIBUNE ON MARCH 25, 1990. A COPY OF THIS NOTICE WAS MAILED TO ALL PERSONS ON THE MAILING LIST FOR THIS SITE.
- * THE REVISED PROPOSED PLAN WAS RELEASED FOR PUBLIC COMMENT ON MARCH 26, 1990.
- * A 60 DAY PUBLIC COMMENT PERIOD ON THE REVISED PROPOSED PLAN WAS HELD FROM MARCH 26, 1990 THROUGH MAY 26, 1990. THIS PUBLIC COMMENT PERIOD WAS ORIGINALLY SCHEDULED TO END AFTER 30-DAYS ON APRIL 26, 1990. HOWEVER, EPA GRANTED A 30-DAY EXTENSION TO THE PUBLIC COMMENT PERIOD AS ALLOWED BY THE NEW NATIONAL CONTINGENCY PLAN.
- * THE STATE OF UTAH PREPARED AND DISTRIBUTED A FACT SHEET ON THE SITE ON APRIL 11, 1990. IT PROVIDED BACKGROUND INFORMATION AND AN UPDATE ON SITE ACTIVITIES.

- * A PUBLIC MEETING WAS HELD ON APRIL 11, 1990 TO RECEIVE PUBLIC COMMENTS ON THE REVISED PROPOSED PLAN. APPROXIMATELY 45 PEOPLE ATTENDED, INCLUDING CITIZENS, ELECTED OFFICIALS, STATE AND EPA OFFICIALS, AND TECHNICAL AND LEGAL REPRESENTATIVES OF LONE STAR INDUSTRIES. A TRANSCRIPT OF THIS HEARING IS AVAILABLE FOR REVIEW AT THE THREE INFORMATION DEPOSITORIES MENTIONED EARLIER IN THIS ATTACHMENT.
- * A BRIEF PRESENTATION WAS MADE BY THE STATE OF UTAH TO THE MAGNA AREA COMMUNITY COUNCIL ON MAY 3, 1990 REGARDING THE STATE'S PREFERRED AND CONTINGENCY ALTERNATIVES FOR THIS SITE. THE MAGNA AREA COMMUNITY COUNCIL VOTED THEIR OBJECTION TO THE CONSTRUCTION OF A NEW LANDFILL NEAR 1300 S. AND 7200 W. IN SALT LAKE CITY, PRIMARILY BECAUSE OF POTENTIAL FUGITIVE DUST PROBLEMS FROM THE SITE.
- * A BRIEF PRESENTATION BY THE STATE OF UTAH TO THE WEST VALLEY CITY COUNCIL WAS MADE ON JUNE 7, 1990 REGARDING THE STATE'S PREFERRED AND CONTINGENCY ALTERNATIVES FOR THIS SITE.
- * AT THE REQUEST OF STATE REPRESENTATIVES DANIEL H. TUTTLE AND BRENT H. GOODFELLOW, A PUBLIC MEETING ON THE STATE OF UTAH'S PREFERRED AND CONTINGENCY ALTERNATIVES FOR THIS SITE WAS HELD IN THE CYPRESS HIGH SCHOOL AUDITORIUM IN MAGNA ON JUNE 21, 1990. THE MEETING WAS HELD PRIMARILY FOR THE PURPOSE OF INFORMING THE RESIDENTS OF MAGNA AND WEST VALLEY CITY CONCERNING THE SITE. APPROXIMATELY 60-70 PEOPLE ATTENDED THE MEETING. REPRESENTATIVES OF THE UTAH BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION, EPA, AND LOCAL GOVERNMENTS WERE PRESENT. INFORMATION WAS PRESENTED CONCERNING THE SITE, AFTER WHICH STATEMENTS AND QUESTIONS FROM THOSE ATTENDING WERE ADDRESSED.

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TABLE 5 - 1

TOTAL ELEMENTAL CONCENTRATION RANGES IN
WASTE CKD AND SOILS MG/KG

ELEMENT/ TRACE METAL	LONE STAR WASTE CKD	TYPICAL WESTERN US SOILS
CALCIUM	144,000 - 189,000	600 - 320,000
MAGNESIUM	5,120 - 22,900	300 - 100,000
SODIUM	350 - 2,940	500 - 100,000
POTASSIUM	3,000 - 35,000	1,900 - 63,000
ARSENIC	3.0 - 27	0.1 - 97
CADMIUM	2.1 - 5.5	
CHROMIUM	8.7 - 28	3.0 - 2,000
LEAD	90 - 1,274	10 - 700
MOLYBDENUM	8.7 - 51.7	3 - 7

TABLE 5-2
CONCENTRATION OF TOTAL METALS IN KILN

BRICK

SAMPLE IDENTIFICATION #	SITE 3-2	SITE 3-4
DATE SAMPLED	5/18/84	5/18/84

MAJOR IONS (PPM EXCEPT AS NOTED)

CALCIUM	116,000	232,000
MAGNESIUM	161,000	190,000
SODIUM	5,320	11,520
POTASSIUM	2,748.0	3,544.0

SAMPLE IDENTIFICATION #	SITE 3-3
	5/18/84

MAJOR IONS (PPM EXCEPT AS NOTED)

CALCIUM	102,000
MAGNESIUM	225,000
SODIUM	7,620
POTASSIUM	5,162.8

OTHER PARAMETERS	SITE 3-2	SITE 3-4
LAB PH (STANDARD UNITS)	11.05	11.20
LAB CONDUCTIVITY (UMHOS/CM)	1.2	1.6

OTHER PARAMETERS	SITE 3-3
LAB PH (STANDARD UNITS)	11.35
LAB CONDUCTIVITY (UMHOS/CM)	2.3

TRACE METALS	SITE 3-2	SITE 3-4
(PPM)	5/18/84	5/18/84

ALUMINUM (AL)	4,700	5,760
ARSENIC (AS)	LT 0.5	LT .05
BARIUM (BA)	75.9	12.4
CADMIUM (CD)	3.19	4.02
CHROMIUM HEX (CR6X)	250.0	220.0
TOTAL CHROMIUM (CU)	4,251.0	1,238.4
COPPER (CU)	90.6	74.3
IRON (FE)	56,680.2	2,064.0
LEAD (PB)	106.8	78.0
MANGANESE (HG)	4,048.6	1,032.0
MERCURY (HG)	.0004	.0003
MOLYBDENUM (MO)	LT .05	LT .05
SELENIUM (SE)	LT .05	LT .05
SILVER (AG)	1.54	2.59
ZINC (ZN)	561.7	428.3
MOISTURE CONTENT (PERCENT)	LT .01	LT .01

TRACE METALS	SITE 3-3
(PPM)	

ALUMINUM (AL)	3,940
ARSENIC (AS)	11.63
BARIUM (BA)	136.0
CADMIUM (CD)	2.98
CHROMIUM HEX (CR6X)	1120.0
TOTAL CHROMIUM (CU)	6976.7
COPPER (CU)	86.0
IRON (FE)	4,186.0
LEAD (PB)	81.7

MANGANESE (HG)	4,186.0
MERCURY (HG)	.0004
MOLYBDENUM (MO)	LT .05
SELENIUM (SE)	LT .05
SILVER (AG)	1.42
ZINC (ZN)	679.1
MOISTURE CONTENT (PERCENT)	LT .01

TABLE 5-3
PONDED SURFACE WATER QUALITY PHASE 1 DATA SUMMARY

	MINIMUM	MAXIMUM	MEAN
MAJOR IONS			
CALCIUM (CA)	14.4	168	61.1
MAGNESIUM (MG)	LT .01	368	81.5
SODIUM (NA)	380	4,990	1,862
POTASSIUM (K)	630	12,300	3,444
BICARBONATE (HCO3)	LT .01	4,587	1,438
CARBONATE (CO3)	LT .01	4,500	1,463
HYDROXIDE (OH)	LT 1	8,650	*
CHLORIDE (CL)	82	2,800	823
FLOURIDE (F)	3.18	133	38.6
SULFATE (SO)	1,100	6,400	2,456
NITRATE (AS N)	LT .02	338	69.7
PHOSPHATE TOTAL (PO AS P)	.16	6.40	1.65

	MINIMUM	MAXIMUM	MEAN
OTHER PARAMETERS			
LAB PH (UNITS)	18.30	13.0	10.28
LAB CONDUCTIVITY (UMHOS/CM)	4,500	60,000	19,437
TOTAL SUSPENDED SOLIDS	34	1,790	336
TOTAL DISSOLVED SOLIDS	3,100	19,300	8,254

ALKALINITES AS CaCO3

	MINIMUM	MAXIMUM	MEAN
M ALKALINITY	304	4,770	1,834
P ALKALINITY	LT 1	13,040	2,089

	MINIMUM	MAXIMUM	MEAN
TRACE METALS (PPM)			
ALUMINUM (AL)	.048	15.88	2.22
ARSENIC (AS)	LT .001	2.53	.449
BARIUM (BA)	LT .01	.10	LT .053
CADMIUM (CD)	LT .0001	LT .0001	LT .001
CHROMIUM HEX (CR6X)	.001	3.00	0.453
TOTAL CHROMIUM (CR)	.001	3.50	.549
COPPER (CU)	.01	1.10	0.26
IRON (FE)	.02	2.00	0.39
LEAD (PB)	LT .001	.370	.111
MANGANESE (MN)	.01	.31	.09
MERCURY (HG)	LT .0002	.0020	LT .003
MOLYBDENUM (MO)	1.19	102.2	18.75
SELENIUM (SE)	LT .001	.027	*
SILVER (AG)	LT .0001	.027	*
ZINC (ZN)	.01	.09	.045

* NOT MEANINGFUL - LESS THAN 2 DATA POINTS ABOVE DETECTION LIMIT.

NOTE: RESULTS ARE BASED ON 8 SAMPLES COLLECTED APRIL 1984. ALL DATA IN MG/L EXCEPT WHERE INDICATED.

TABLE 5-4
RESULTS OF WASTE CKD CHEMICAL ANALYSES

SITE 2

	SURFACE COMPOSITE	SURFACE FRACTION LT 53 UM
CONSTITUENT		
ALUMINUM (AL)	12900	13300
ARSENIC (AS)	12	13
BARIUM (BA)	340	410
CADMIUM (CD)	13	9
CHROMIUM (CR)	40	40
CHROMIUM VI	0.9	0.7
IRON (FE)	10400	11000
LEAD (PB)	560	590
MANGANESE (MN)	160	170
MERCURY (HG)	LT .05	LT .05
MOLYBDENUM (MO)	LT 20	LT 20
ZINC (ZN)	290	290

SITE 2

	EXPOSED COMPOSITE	SURFACE FRACTION LT 53 UM
PH (UNITS)	9.9	-
TOTAL SOLIDS (PERCENT)	99.2	-

SITE 3

	SURFACE COMPOSITE	SURFACE FRACTION LT 53 UM
CONSTITUENT		
ALUMINUM	13600	13300
ARSENIC	4.4	6.5
BARIUM	530	780
CADMIUM	8	7
CHROMIUM	30	50
CHROMIUM VI	1.7	1.3
IRON	9600	10300
LEAD	500	450
MANGANESE	190	200
MERCURY	LT .05	LT .05
MOLYBDENUM	LT 20	LT 20
ZINC	350	350

SITE 3

	SURFACE COMPOSITE	SURFACE FRACTION LT 53 UM
PH (UNITS)	10.1	-
TOTAL SOLIDS (PERCENT)	98.9	-

WEST SITE

CONSTITUENT	SURFACE COMPOSITE	SURFACE FRACTION LT 53 UM
ALUMINUM	9300	13700
ARSENIC	5.1	7.8
BARIUM	660	1600
CADMIUM	4	7
CHROMIUM	39	29
CHROMIUM VI	0.4	1.0
IRON	17500	13500
LEAD	610	590
MANGANESE	240	260
MERCURY	LT .05	0.07
MOLYBDENUM	40	14
ZINC	930	620

WEST SITE

	SURFACE COMPOSITE	SURFACE FRACTION LT 53 UM
PH (UNITS)	9.9	-
TOTAL SOLIDS (PERCENT)	99.4	-

CONSTITUENT CORE SAMPLES

ALUMINUM	16419
ARSENIC	33.6
BARIUM	424
CADMIUM	9.3
CHROMIUM	35.1
CHROMIUM VI	2.7
IRON	13668
LEAD	815
MANGANESE	244
MERCURY	LT .05
MOLYBDENUM	72
ZINC	527

PH (UNITS)	12.2
TOTAL SOLIDS (PERCENT)	100

NOTES: ALL VALUES IN MG/KG EXCEPT WHERE INDICATED.

"CORE SAMPLES" VALUES ARE THE MEANS DERIVED FROM 16 CORE SAMPLES FROM SITES 2 AND 3 COLLECTED MAY 1984 ADJUSTED TO DRY WEIGHT BASIS.

OTHER RESULTS ARE SAMPLES COLLECTED IN MARCH 1989 AT THE INDICATED AREAS.

"SURFACE COMPOSITES" ARE COMPOSITED SAMPLES OF SURFACE ONE-HALF INCH OF CKD AT 7 LOCATIONS ON SITE 3, 6 LOCATIONS ON SITE 2 AND LOCATIONS ON THE WEST AREA.

"SURFACE FRACTION"LESS THAN 53 UM" ARE COMPOSITED FROM SAME LOCATIONS AS "SURFACE COMPOSITES" BUT ARE COMPRISED ONLY OF MATERIAL PASSING THE 53 UM SIEVE.